COMPOSING WITH CONSTRAINTS

JORGE VARIEGO

100 Practical Exercises in Music Composition

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To my sons Sebastián, Aiden, and Manuel.

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FOREWORD

Constraints are often seen as limitations, but they are omnipresent in the musical context and can unfold considerable creative potential in the compositional process.

To simplify, one could say that in contrast to a rule, which rather formulates a strict if–then relationship, constraints establish a network of conditions in which musical structure can evolve in manifold ways.

In this sense, constraints are the essential basis of every musical analysis and also serve as a conscious or unconscious guideline for the act of musical composition.

As far as analysis is concerned, a work must meet certain criteria in order to be assigned to a certain musical style or the oeuvre of a certain composer. And it is only through constraints that it is possible to transform the analytical approach into a generative one, that is, to write exercises in the style of a particular musical genre or of a particular composer.

Of course, many composers are innovators who break out of the compositional paradigms of their time or introduce radical innovations, but preferably not without being aware of the musical tradition and thus being able to transcend it in a reflected manner.

Apart from these analytical or related style-generating approaches, constraints are also of decisive importance in the compositional process.

The act of composition is framed by a number of constraints, which may be consciously defined or applied unconsciously. Even when relying mostly on their own intuition, the composer is nevertheless confronted with various constraints that determine the compositional structure to a certain degree, such as the dynamic, articulatory or pitch capabilities of the instruments, and more.

Now one could provocatively ask the question, why further “restrictions” beyond the intrinsically given constraints should be actively formulated in the compositional process?

First of all, because for most composers the deliberately chosen constraint is not a restriction but a fundamental means of creating the musical structure—and this does not have to involve sophisticated techniques of algorithmic composition or generative music at all. The process already begins with the choice of instrumentation, the choice of a certain harmonic material, or even the preference for certain rhythmic constellations, just to name a few examples.

Deliberate restrictions, however, not only allow a clear structuring of the material, but additionally give rise to new possibilities of musical expression by opening new paths that would hardly have been possible without applying any constraints—or formulated as a question outside the musical context: what point can lipograms make in literature, apart from the mastered linguistic challenge?

Last but not least, the application of constraints in a musical context abstracts from the individual case and creates a meta-class of possible compositions. On the one hand, this enables experimentation with different musical realizations that nevertheless satisfy a superordinate musical concept through a network of given conditions. On the other hand, it is precisely this abstraction that allows an analytical view of one's own work and opens up new ways of reflecting on one's own creative compositional process.

I wish my esteemed colleague Jorge Variego every success with this book and for the readers I would like to add: May the force of constraints be with you!

Gerhard Nierhaus

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Writing a book is a journey, a long and slow one. Throughout the trajectory of writing *Composing with Constraints* I received the encouragement and priceless help of a number of people without whom this project would have never arrived at its destination. Infinite gratitude to (in no particular order) Ed Klorman, Gerhard Nierhaus, Nathan Curtis, Darius Edwards, Emily Leopin, Caleb Cannon, Karen Wemhoener, Michael Wiley, and Norman Hirschy.

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Introduction

Composing with Constraints proposes an innovative approach to the instruction of the craft of music composition based on tailored exercises to help students develop their creativity.

The fundamental premise of *Composing with Constraints* is grounded on my previous book on algorithmic composition, which—in a few words—states that *all* compositional approaches are algorithmic and can be reduced to a formal process that involves a series of logical steps. When composition gets condensed to a series of logical steps, it can then be taught and learned more efficiently. With this methodology in mind, *Composing with Constraints* proposes a variety of exercises in the form of algorithms to help the student composer and the instructor create tangible work plans, with high expectations and successful outcomes.

The book is arbitrarily structured around the parameters of melody, rhythm, harmony, texture, and pre-compositional approaches. All chapters start with a brief note on terminology and general recommendations for the instructor and the student. The first five chapters offer a variety of exercises that range from analysis and style imitation, to the use of probabilities. The chapter about pre-compositional approaches offers original techniques that a student composer can implement in order to start a new work. This last section of the book fosters creative connections with other disciplines such as math, visual arts, and architectural acoustics.

Each of the 100 exercises contained in the book proposes a unique set of guidelines and constraints intended to place the student in a specific compositional framework. Through those compositional boundaries the student is encouraged to produce creative work within a given structure. Using the methodologies in this book, students will be able to create their own outlines for their compositions, making intelligent and educated compositional choices that balance reasoning with intuition.

Depending on the class in which it is adopted, *Composing with Constraints* can be a priceless aid for the instructor. When used to complement a music theory class, the exercises can be used as compositional projects, to provide creative frameworks to the theoretical concepts studied in class and even to trigger group discussions. In a class on analysis, the book can be an invaluable tool for stylistic understanding, appropriation, and imitation. Finally, when used in individual and group composition lessons, the book can provide an enormous palette of concrete assignments that the instructor can use to guide the students' compositional development and practice.

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The grading rubric provided in the book is a tool for both the instructor and the student that intends to quantize intangibles with the sole purpose of making the grading scheme meaningful. Divided in four categories (i.e., followed guidelines, orchestration, idiomatic use of the instruments, and "open spaces"), the grading rubrics clarify in detail the grade awarded to the student, showing the aspects of the work that can be improved with space for comments and recommendations. Through the quantization of "open spaces," the rubric also helps the instructor ponder the students' creative use of the aspects of the exercises not constrained or left "free" in the guidelines.

How to Use the Book

The exercises contained in the book can be used in a variety of ways. Far from a manual on how to compose, *Composing with Constraints* proposes a series of frameworks to stimulate—and sometimes guide—your musical creativity.

All the exercises can (and should!) be changed, adapted, altered, tailored, and even rewritten to fulfill unexpected compositional needs. Remember that they are frameworks to incentivize new ideas and by which to practice writing music.

Additionally, the exercises can be easily integrated in private composition lessons, courses of music theory, orchestration and analysis. They can be used as creative assignments where to apply theoretical knowledge, explore color, and learn more about the different instruments, and use analysis as a source for a creative practice. The latter is embedded in a variety of ways, ranging from deconstruction approaches, to stylistic imitations. Can you write a recipe on how to compose like Chopin? That skill comes with a combination of analysis and its creative application.

Another suggestion can be regarding the way you may want to navigate through the material. First, the exercises are not presented in sequential order. You can freely transit from 92 to 3 to 20. There are some suggested paths in Appendix B that touch a little of every chapter. Second, I recommend that you try the same exercise multiple times exploring the "open spaces" and a different given material. What is not constrained in the guidelines can be explored and exploited creatively.

Composing with Constraints is not a book on music theory. However, all the exercises start with a short theoretical note intended simply to provide context to a specific activity. The goal of the book is to put your skills in action.

Always challenge, be curious, make connections between the worlds that you live in. If you are a performer, bring to your compositions things that resonated with you as a player, if you are a math expert, use your skill to create a function to determine the "next note." If you are a cook, write compositional recipes. Connect worlds, write lists, make up your own techniques, finish your pieces, and stay creative.

Recommendations for the Instructor

The 100 frameworks contained in the book can be used as "they are" or changed to fulfill the needs of a course, assignment, or individual lesson. All the frameworks' guidelines are intentionally flexible. Instrumental forces can be modified, meters changed, durations extended, and so on.

Once the instructor has determined the exact contents of the exercise, it should then be followed as strictly as possible by the student. This is quite important, as it is one of the pillar premises of the book: the more strict constraints we impose to ourselves, the freer we become as creative artists. Again, the flexibility of the 100 exercises should let you (the instructor) adjust them to a specific need (e.g., use only woodwind instruments to match a specific module in an orchestration course). On the other hand, the student should have a clear set of non-modifiable guidelines to complete their work when assigned. In sum, the instructor has flexibility to adjust the guidelines, but once set, those enabling constraints should be followed with the utmost rigor.

The repetitive spirit of the book is intentional because none of the 100 exercises are identical! In most of the chapters, an exercise introduces a new topic and is followed by two or three that build up on it with small variations. This approach complements with the fact that the material can be navigated in any direction, following the exercises in any order. The curricula proposed in Appendix B can be modified. An interesting experiment is to assign students the same exercise several times throughout the course of a semester!

The problematic of orchestration is embedded in every exercise and not in a dedicated chapter. The challenges of working with different instrumental forces are included in the book from the very beginning and conceived as an integral part of the compositional craft. In this book, orchestrational color is engrained in the study of composition. The chapter on texture contains a few exercises that focus on changes of color (74) and orchestrational volume (76).

Guidelines and "open spaces." All the exercises contain both a set of clearly denoted guidelines and "open spaces." The purpose behind those *free* spaces is to stimulate students to explore different outcomes within the same set of constraints. These intentionally open doors are presented literally (i.e., "all other parameters are free"), and some can be discovered (i.e., finding a "non-constrained" parameter in the guidelines). These *spaces* should be stretched to the limit, taking the same exercise to different endpoints without compromising the given constraints. The rubric proposed in Appendix A considers the "open spaces" as one of the pillars for the evaluation of the projects.

Appendices C and D offer extra resources that augment the scope of the book. They can be a source for consultation and enhancement of the material contained in the exercises.

- Supplemental melodic excerpts for analysis and application.
- Piano excerpts for the study of texture, harmonic progressions and others.
- A transposition table. Though not exhaustive, this tool can become handy when dealing with transposing scores.
- A suggested grading rubric that can help quantify aspects of the students' creative work. The percentiles are intentionally left open to facilitate grading adjustments to a course requirement or individual lesson planning.
- Twelve-week suggested curriculums are included to help navigate the book in a variety of ways.

The book can be navigated in a variety of ways because the exercises are not structured in ascending difficulty (i.e., 23 is not harder than 5 and 1 is not easier than 45). Many paths can be followed; some suggestions are included in Appendix B. The proposed curricula in

Appendix B are structured upon two typical one-semester courses: 1) weekly individual sessions, 2) group sessions with two meetings per week. The 12-week plan is designed around a balance between chapters and musical parameters tackled; it should also give enough room for change when needed. Additionally, the exercises can be repeated, assigned multiple times with different results.

Most of the exercises provide an example of the suggested *process* in order to complete it. Even though this is not a requirement per se of the exercises, it could be a fruitful addition to help students articulate about their creative processes.

1

Melody (Exercises 1–20)

Preliminary Notes

When present in a composition, a melodic line can have a prominent role. Ravel, Palestrina, Piazzolla, Clarke, and Ginastera are some of the many composers who have written memorable melodies.

In preparation to composing your own lines, it is a good practice to analyze the melodies of others and attempt to extract their structural components. Pitch collections, intervals, durations, ranges, contours, and implied harmonies could be things to look for. Let your findings influence your own writing, use your analysis as a creative tool!

The composition of a melody is much more than deciding on a succession of pitches. It can be informed by a number of other factors. Before starting with the exercises, this non-exhaustive list proposes several points for reflection:

1) Rhythm: the rhythmic structure of a melody can influence its forward motion and pace. It can also affect the relative importance of its notes (i.e., the notes with longer durations can be perceived as more important, the opposite can happen to the shorter values).
2) Contour: the arc and the *focal point* in a melody can suggest the existence of a tension-release dichotomy. On the other hand, if the contour is mainly flat (without a focal point), the areas of ambiguity increase.
3) Pitch collections: if the collection of pitches used in a melody is a pentatonic scale (with no semitones), then the color will be characteristic and *all* five pitches could be equal points of repose. On the other hand, if the collection of pitches is a major scale, then some tendencies and the primacy of scale degrees 1 and 5 can emerge. A 12-tone row can influence the outcome substantially in a completely different way!
4) Repeated notes: the note that is repeated in a melody can be perceived as more *important* in context.
5) Beat and meter: the pitches of a melody occurring on the strong part of the beat can be perceived as structural, while the ones placed on off beats can seem to have a less important role. Similarly, the melody notes that happen on the downbeats (i.e., the beginning of the measure) can also be perceived as more significant.
6) Intervals and implied harmonies: the intervallic content of a melody can be a resource to *imply* an underlying harmony or to negate it. A melody mainly built on thirds can suggest a tertian harmonic progression (i.e., with chords built upon thirds). A line that moves by step does not distinctly imply any harmonic progression.

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7) First and last pitches of a melody: the notes where a melody starts and ends can be perceived as being more significant.
8) Register: a drastic register change can alter the relative importance of the pitches around it and also the perception of the pulse and note groupings.
9) Pulse: a melody where the pulse is *not perceivable* can favor a focus on other of its aspects.
10) Articulations and dynamics: these can influence the character, playability, perception of the meter, and the relative importance of the pitches.
11) Pitch collection and "dissonance": the idea of dissonance in a melody can be associated with the *context* (e.g., in a melody composed only with the pitches of the G major scale, the occurrence of a C♯ can create dissonance because of the context in which it appears—even though it does not clash *vertically* with another sound).
12) Complex or compound melodies: a single melodic line can embed several lines in one, creating the illusion of a polyphony.
13) Commonalities: scales and arpeggios are compositional *commonalities* because they are used *very* often. A melody built mostly on commonalities will hardly become memorable.

This non-exhaustive list shows a number of points for reflection when writing or analyzing a melody, also intended as anchors to guide the listening.

In this chapter, the exercises focus on the *single melodic line*. Exercises 1 to 6 are based on the idea of writing melodies with given pitch collections (ordered and unordered), using focal points and pitch collections that have elements in common. The goal of frameworks 7 and 8 is to compose melodies using concatenated triads; 9 and 10 focus on the use of segments (of equal and unequal duration); 11 proposes the "translation" of a given image into sound; 12 through 14 incorporate the concept of integer notation. Simple use of probabilities is the basis of exercise 15. Numbers 16 and 17 use 12-tone rows and simple transformations. In 18 the objective is to use analysis (specifically the inventory of interval types from a given melody) in a creative way. Exercises 19 and 20 use the concept of simple melodic motifs and processes of elimination to compose melodies.

The outcome of the 20 work frames of this section can be taken further, solved multiple times, combined with other processes or simply used in part to trigger new ideas. Additionally, the melodies composed in this chapter can be reused for any of the exercises contained in other chapters.

Exercises

1

Exercise 1: Focal Point

In this exercise you will compose a melody for solo **flute** using the given constraints.

Guidelines:

1) Create a scale that uses between five and seven different pitches.
2) Using exclusively the notes of your scale **in any order or register**, compose a melody that fulfills the following requirements:
   a. Duration: between 10 and 12 measures.

   - b. Meter: 4/4.
   - c. Instrument: flute.
      - i. The score should include all markings for articulations, breath marks, dynamics, phrasing, and tempo.
      - ii. You must consider the instrument's range (see Appendix D).
   - d. The melody must have a focal point (i.e., the highest note of the melody).
   - e. The rhythmic component must be constructed exclusively using material extracted from the excerpts contained in Figure 1.1.

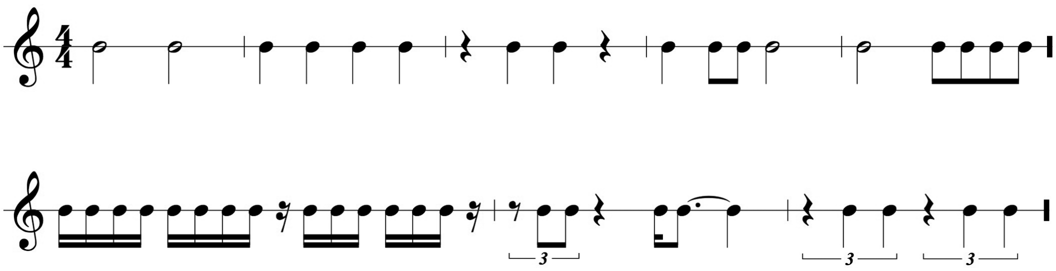


Figure 1.1. Rhythmic excerpts.

3) You must show the scale that you created clearly in your score.
4) All other parameters are free.

2

Exercise 2: Using a Scale

In this exercise you will compose a melody for solo **oboe** using a given scale.

Guidelines:

1) Use the scale given in Figure 1.2.

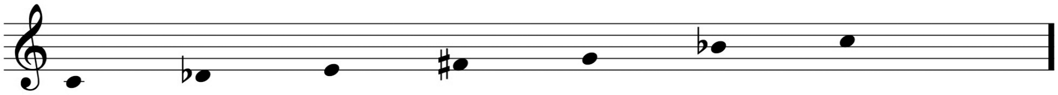


Figure 1.2. Given scale for exercise 2.

2) Using exclusively the notes of the given scale **in any order and register**, compose a melody that fulfills the following requirements:
   - a. Duration: between 10 and 12 measures.
   - b. Meter: 3/4.
   - c. Tempo: quarter note = 80.
   - d. Instrument: oboe.
      - i. The score should include all markings for articulations, breath marks, dynamics, phrasing, and tempo.
      - ii. You must consider the instrument's range (see Appendix D).
   - e. The melody can have a focal point (i.e., the highest note of the melody) but it is not mandatory.
   - f. The melody must start and end on different pitches (i.e., if you start on a C, you must end on any note but C).
   - g. The rhythmic component and articulations must be constructed exclusively using material extracted from the excerpts contained in Figure 1.3.

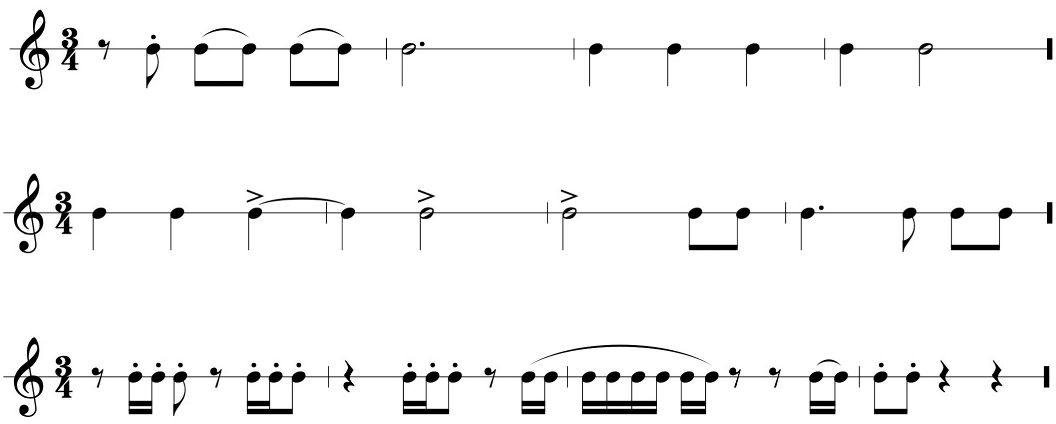


Figure 1.3. Rhythmic component for exercise 2.

h. All other parameters are free.

3

Exercise 3: Using a Scale and a Subset

In this exercise you will compose a melody for solo **clarinet** using a given scale and applying transformations to it.

Guidelines:

1) Use the scale given in Figure 1.4.

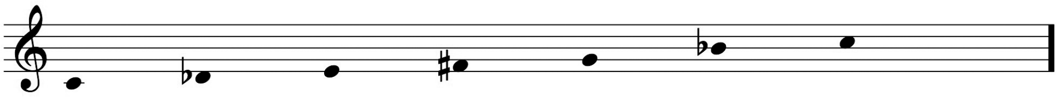


Figure 1.4. Given scale for exercise 3.

2) Using the notes of the given scale **in any order and register**, compose a melody that fulfills the following requirements:
    a. Duration: between 10 and 12 measures.
    b. Meter: 4/4.
    c. Tempo: quarter note = 60.
    d. Instrument: clarinet in B♭.
        i. The score should include all markings for articulations, breath marks, dynamics, phrasing, and tempo.
        ii. You must consider the instrument's range (see Appendix D) and transposition (write your solution in **transposed** score).
    e. The melody should employ all the available pitches in any order and register in the first five measures of the exercise. From measure six until the end, use only a subset of four pitches of the original scale (e.g., C E F♯ G or E F♯ G B♭).
    f. All other components are free.

4

Exercise 4: Using a Scale with a Substitute Pitch

In this exercise you will compose a melody for solo **bassoon** using a given scale and applying the given transformations to it (using a substitute pitch).

Guidelines:

1) Use the scale given in Figure 1.5.

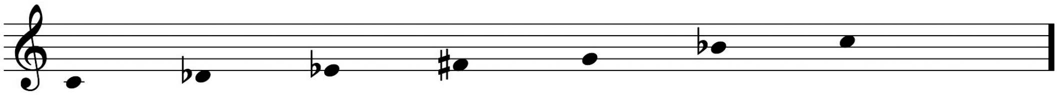


Figure 1.5. Given scale for exercise 4.

2) Using the notes of the given scale **in any order and register**, compose a melody that fulfills the following requirements:
   a. Duration: between 10 and 12 measures.
   b. Meter: 5/4.
   c. Tempo: quarter note = 120.
   d. Instrument: bassoon.
      i. The score should include all markings for articulations, breath marks, dynamics, phrasing, and tempo.
      ii. You must consider the instrument's range (see Appendix D).
   e. In the first five measures, the melody should employ *all the available pitches* from the given scale in the given order and register. Pitches can be repeated freely. From measure six until the end, you should **substitute one pitch** from the original scale with one of your choice not present in the original collection (i.e., in the scale in Figure 1.5 the B♭ becomes B natural).
   f. Use only eighth notes and eighth note rests.
   g. All other components are free.

5

Exercise 5: A Scale in a Given Order

In this exercise you will compose a melody for solo **trumpet** using a given scale and applying simple transformations to it.

Guidelines:

1) Use the scale given in Figure 1.6.

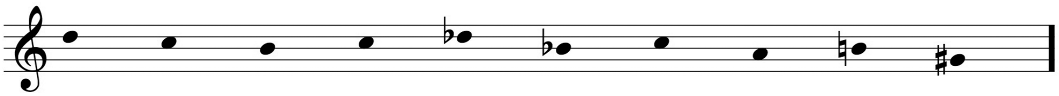


Figure 1.6. Given scale for exercise 5.

2) Using the notes of the given scale **in the given order and register**, compose a melody that fulfills the following requirements:
   a. Duration: between eight and ten measures.
   b. Meter: 4/4.
   c. Tempo: quarter note = 108.
   d. Instrument: B♭ trumpet.
      i. The score should include all markings for articulations, breath marks, dynamics, mutes, phrasing, and tempo.

   ii. You must consider the instrument's range and transposition (see Appendix D). Write your solution in **transposed** score.
  e. All other components are free.

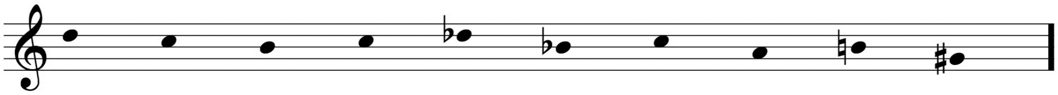
Exercise 6: A Scale in a Given Order with Ordered Rhythm

In this exercise you will compose a melody for solo **vibraphone** using a given **ordered** scale and rhythmic structure.

Guidelines:

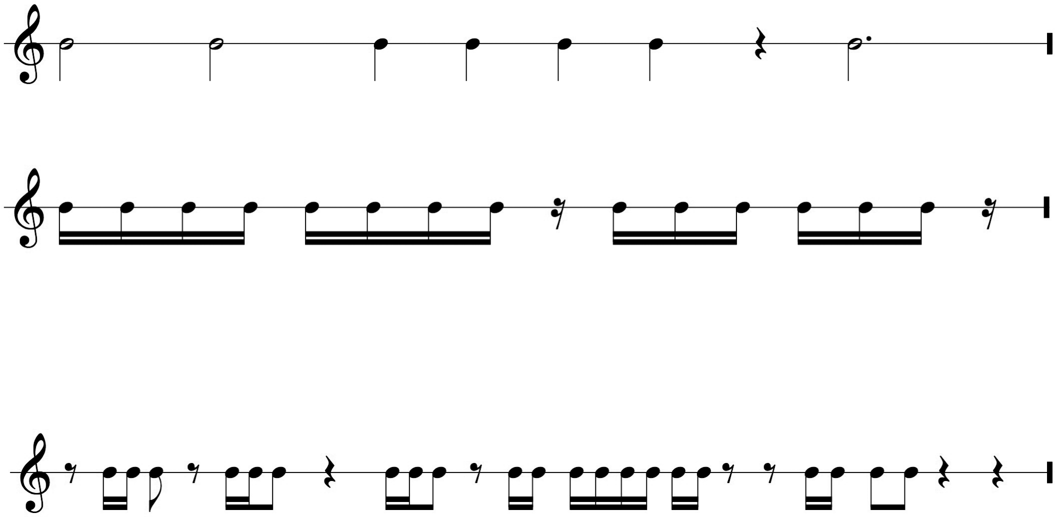
1) Use the scale given in Figure 1.7.

Figure 1.7. Given scale for exercise 6.



2) Using the notes of the given scale **in the given order and register**, compose a melody that fulfills the following requirements:
   a. Duration: between eight and ten measures.
   b. Meter: free.
   c. Tempo: quarter note = 108.
   d. Instrument: vibraphone.
      i. The score should include all markings for articulations, type of mallets, dynamics, phrasing, and tempo.
      ii. You must consider the instrument's range (see Appendix D).
   e. The rhythm **must** be one of the structures from Figure 1.8. It can be repeated multiple times.
   f. The ordered scale can also be repeated (restarted) multiple times.
   g. All other components are free.

Figure 1.8. Rhythmic structures for exercise 6.



7

Exercise 7: Concatenating Triads

In this exercise you will compose a melody for solo **French horn** following the given guidelines.

Guidelines:

1) Using **exclusively pitches from concatenated major and minor triads** (i.e., the next triad has one or two pitches in common with the previous one) compose a melody that fulfills the following requirements:
   a. Duration: between eight and ten measures.
   b. Meter: 6/8.
   c. Tempo: dotted quarter note = 60.
   d. You can start and finish on any note.
   e. Instrument: French horn.
      i. The score should include all markings for articulations, breath marks, dynamics, phrasing, and tempo.
      ii. You must consider the instrument's range and transposition (see Appendix D). Write your solution in **transposed** score.
      iii. All other parameters are free.

Process:

1) Start with a triad (major or minor) of your choice.
2) Use the last pitch of that triad to build the next triad (see Figure 1.9).

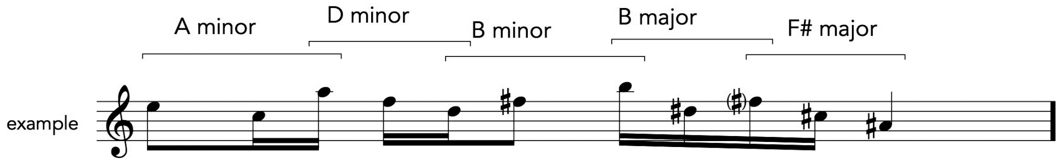


Figure 1.9. Example of concatenated triads with one note in common. Major and minor triads only.

8

Exercise 8: Concatenating Triads of Any Type

In this exercise you will compose a melody for solo **bass clarinet** following the given guidelines.

Guidelines:

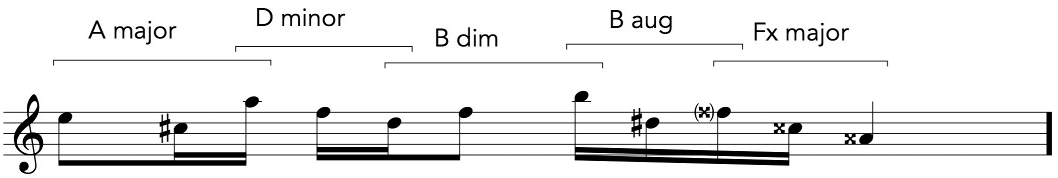
1) Using **exclusively concatenated triads** (i.e., major, minor, diminished, and augmented triad that have one or two pitches in common) compose a melody that fulfills the following requirements:
   a. Duration: between eight and ten measures.
   b. Meter: 7/8.

   c. Tempo: eight note = 60.
   d. You can start and finish on any note.
   e. Instrument: bass clarinet.
      i. The score should include all markings for articulations, breath marks, dynamics, phrasing, and tempo.
      ii. You must consider the instrument's range and transposition (see Appendix D). Write your solution in **transposed** score.
      iii. All other parameters are free.

Process:

1) Start with a triad (major, minor, diminished, or augmented) of your choice.
2) Use the last one or two pitches of that triad to build the next triad (see Figure 1.10). Repeat this step recursively.

Figure 1.10. Example of concatenated triads with two notes in common. Major, minor, diminished, and augmented triads.



9

Exercise 9: Segments of Equal Duration

In this exercise you will compose a melody for solo **tenor trombone** after a given melody using segments of equal duration.

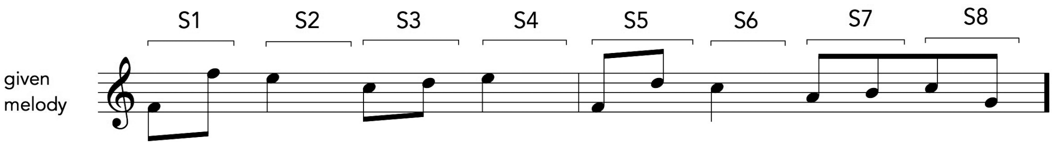
Guidelines:

1) Using **segments of equal duration** compose a melody that fulfills the following requirements:
   a. Duration: between eight and ten measures.
   b. Meter and tempo from the chosen given melody (see Appendix C for more options).
   c. Instrument: tenor trombone.
      i. The score should include all markings for articulations, breath marks, dynamics, mute, phrasing, and tempo.
      ii. You must consider the instrument's range (see Appendix D).

Process:

1) Choose any melody and divide it in segments of equal duration (see Figure 1.11).

Figure 1.11. Segmented melody.



2) Shuffle the segments in any way to create a new melody. In this step you can choose to repeat segments but *all* of them must be present (see Figure 1.12).

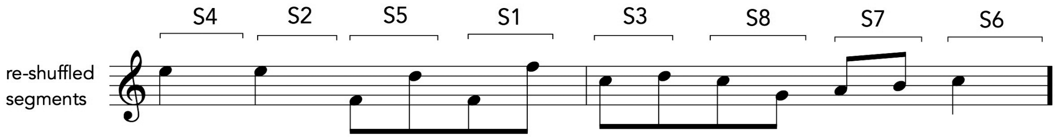


Figure 1.12. Segmented melody with re-shuffled segments.

The given melodies are shown in Figure 1.13.

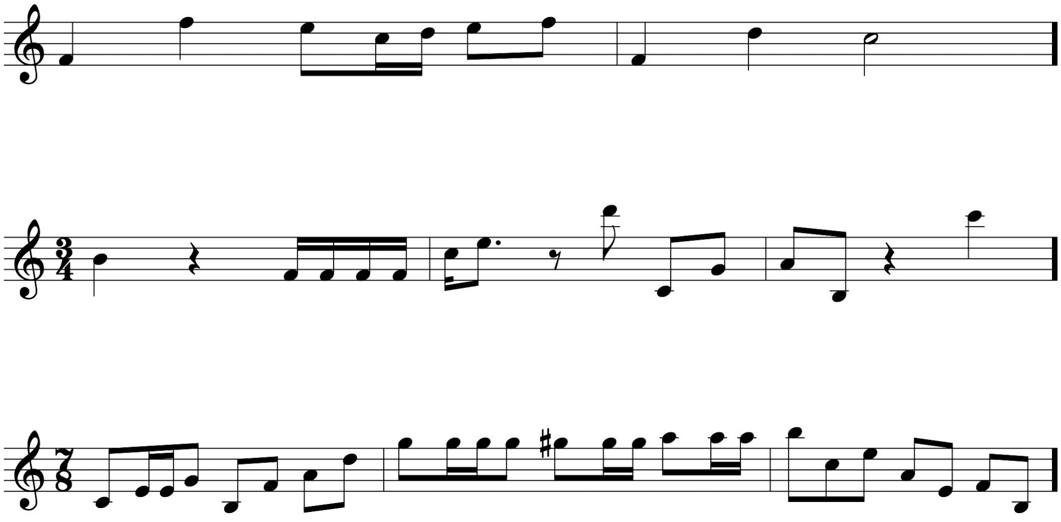


Figure 1.13. Given melodies for exercise 9.

10

Exercise 10: Segments of Unequal Duration

In this exercise you will compose a melody for solo **cello** after a given melody using segments of unequal duration.

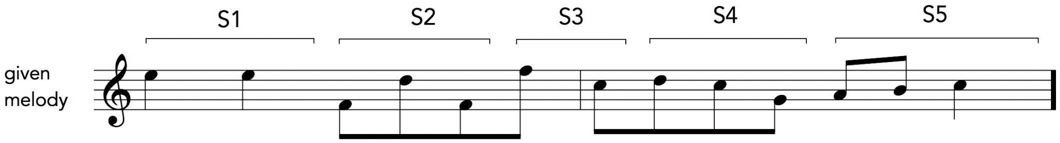
Guidelines:

1) Using **segments of unequal duration** compose a melody that fulfills the following requirements:
   a. Duration: between 10 and 12 measures.
   b. Meter and tempo from the chosen given melody (you can use the options given in exercise 9 or see the Appendix C for more options).
   c. Instrument: cello.
      i. The score should include all markings for articulations, bowings, dynamics, mute, phrasing, and tempo.
      ii. You must consider the instrument's range (see Appendix D).

Process:

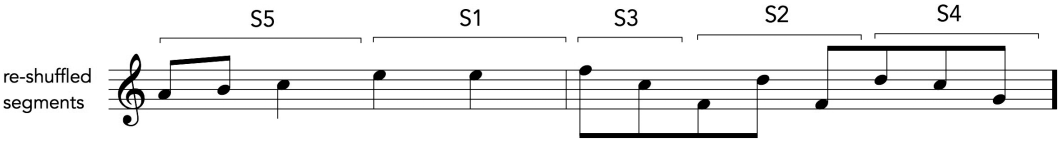
1) Choose a melody and divide it in segments of unequal duration (see Figure 1.14).

Figure 1.14. Segmented melody with segments of unequal duration.



2) Shuffle the unequal segments in any way to create a new melody. In this step you can choose to repeat segments but all of them must be present (see Figure 1.15).

Figure 1.15. Segmented melody with re-shuffled segments of unequal duration.

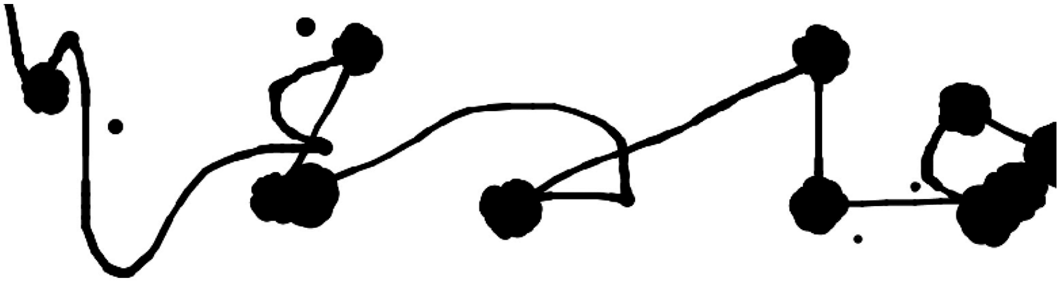


11

Exercise 11: The Melody of an Image

In this exercise you will compose a melody for solo **double bass** after the following given image (see Figure 1.16).

Figure 1.16. Graphic score. This image was generated with Processing. For more information visit processing.org.



Guidelines:

1) Using the given image as source, compose a melody that fulfills the following requirements:
   a. Duration: between 10 and 12 measures.
   b. Meter, tempo, and pitch content are free.
   c. Instrument: double bass.
      i. The score should include all markings for articulations, bowings, dynamics, phrasing, and tempo.
      ii. You must consider the instrument's range (see Appendix D).

Process:

1) First think and articulate on how is the image going to inform your melody. **Write a list** of the connections along with your melody. **Include this list in your work.**
2) Use the following questions as triggers:
   a. Is the *y-axis* pitch? Is the *x* time? Is it the other way around?
   b. How do you interpret the curved lines?
   c. Is the thickness of the stroke going to influence your melody?
   d. Are the dots of different sizes going to be part of your melodic construction? How are you going to interpret them?

e. Is the image static or you are going to scan through it in some direction? Left to right? Right to left? Or top to bottom? Or in some other way?

12

Exercise 12: Integer Notation

In this exercise you will compose a melody for solo **tuba** using integer notation. Integer notation refers to the translation of all pitches of the chromatic scale into whole numbers (see Figure 1.17).

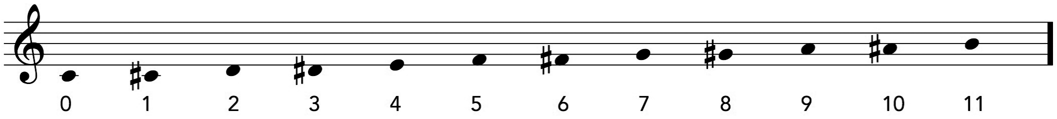


Figure 1.17. Chromatic scale "translated" into whole numbers.

Guidelines:

1) Using integer notation as source, compose a melody that fulfills the following requirements:
   a. Duration: between 10 and 12 measures.
   b. Meter and tempo are free. You can use one of the rhythmic structures from exercise 6.
   c. Instrument: tuba.
      i. The score should include all markings for articulations, bowings, dynamics, phrasing, and tempo.
      ii. Consider the instrument's range (see Appendix D).

Process:

1) First generate a sequence of numbers between 0 and 11. For this sequence you can apply a variety of sources (e.g., dates of birth of close friends and phone numbers).
2) After you have the sequence, assign it to pitches according to the image. The pitches can appear in any register (e.g., 0 equals all Cs in **any register**).
3) A simple example would be: 8659747550 → G♯–F♯–F–A–G–E–G–F–F–C.

13

Exercise 13: Integer Notation Collections and Subsets

In this exercise you will compose a melody for solo **piccolo** using integer notation, a pitch collection, and subsets.

Guidelines:

1) Using integer notation as source, compose a melody that fulfills the following requirements:
   a. Duration: between 10 and 12 measures.
   b. Meter: 5/8.
   c. Tempo: eight note = 120.
   d. Form: in the first five measures of your melody use exclusively a subset of six pitches from the chromatic scale (e.g., 1, 3, 4, 7, 8, 11). From measure six until

the end use exclusively the remaining pitches (e.g., in the given example 0, 2, 5, 6, 9, 10).
   e. You can build your subsets freely. Mind the relationship between form and pitch content.
   f. All other parameters are free.
   g. Instrument: piccolo.
      i. The score should include all markings for articulations, dynamics, phrasing, and tempo.
      ii. You must consider the instrument's range (see Appendix D).

14

Exercise 14: Integer Notation Collections and Transition Subsets

In this exercise you will compose a melody for solo **English horn** using integer notation, a pitch collection, and subsets.

Guidelines:

1) Using integer notation as source, compose a melody that fulfills the following requirements:
   a. Duration: 12 measures.
   b. Meter: 4/4.
   c. Tempo: quarter note = 60.
   d. Form and pitch content: in the first four measures of your melody use exclusively a subset of six pitches from the chromatic scale (e.g., 1, 3, 4, 7, 8, 11). From measure nine until the end use exclusively the pitches not included in the first set that completes the chromatic scale (e.g., in the given example 0, 2, 5, 6, 9, 10). From measures five to eight (middle section) use a set that combines the first and second sets in equal parts (e.g., 1, 3, 4 from the first set and 0, 2, 5 from the second one).
   e. All other parameters are free.
   f. Instrument: English horn.
      i. The score should include all markings for articulations, dynamics, phrasing, and tempo. You must consider the instrument's range and transposition (see Appendix D).
      ii. Write your melody in transposed score.

15

Exercise 15: Simple Probabilities

In this exercise you will compose a melody for solo **alto saxophone** using simple probabilities.

Process:

1) From the given melody, extract the chart of transitions. In order to do so, study the movement of each of the pitches. Ask yourself; does a G go to a B? Does it go to a C? Does it go to an A? Complete the study exhaustively on every pitch available to complete the chart.

In the given melody (see Figure 1.18), the transitions are included in Table 1.1. If the current note is a C, the melody can only go to C or G; if it goes to G then it can go to F, G, or A. And so it continues.

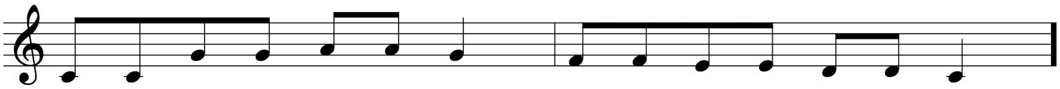


Figure 1.18. Given excerpt for chart of transitions.

Table 1.1 Chart of transitions extracted from the excerpt in Figure 1.18.

		Next note					
		C	***D***	***E***	***F***	***G***	***A***
Current note	C	•				•	
	D	•	•				
	E		•	•			
	F			•	•		
	G				•	•	•
	A					•	•

2) After completing the chart of transitions on the given melody, compose a new melody (see Figure 1.19) following those transitions.

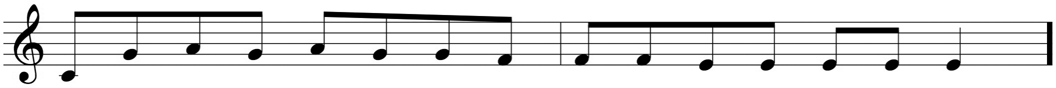


Figure 1.19. Melody composed using the chart of transitions (one possible solution).

Guidelines:

1) Using the chart of transitions that you created as source (based on the excerpt in Figure 1.20), compose a melody that fulfills the following requirements:
   a. Duration: 10 measures.
   b. Start on any pitch included in the chart that you created!
   c. Meter: 6/4.
   d. Tempo: quarter note = 100.
   e. All other parameters are free.
   g. Instrument: alto saxophone.
      i. The score should include all markings for articulations, dynamics, phrasing, breath marks, and tempo. You must consider the instrument's range and transposition (see Appendix D).
      ii. Write your melody in transposed score.

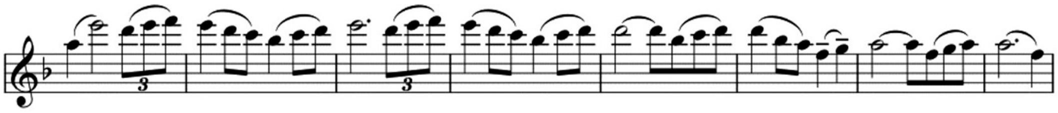


Figure 1.20. Maurice Ravel, String Quartet in F (excerpt).

16

Exercise 16: A 12-tone Row

In this exercise you will compose a melody for solo **viola** using a 12-tone row. **A 12-tone row is a series that contains all 12 pitches in a specific order**.

The two examples of 12-tone rows in Figure 1.21 are similar because they both are non-repetitive (none of the 12 pitches is repeated), but **they are different in regarding the order in which all 12 pitches appear**. The integers in these examples refer to the **order of appearance of the pitches in the row**. Do not confuse them with integer notation!

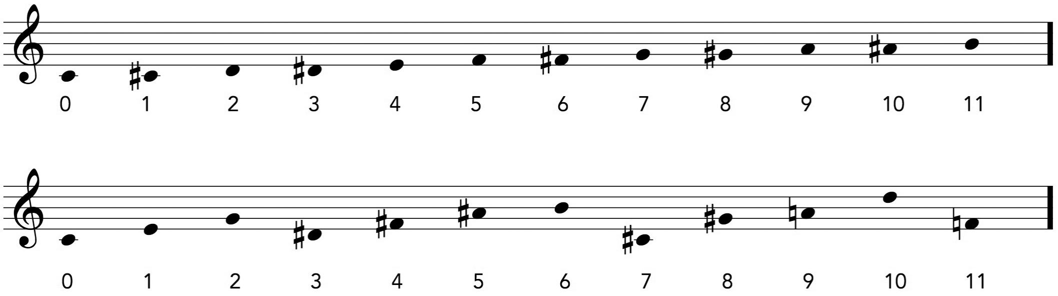


Figure 1.21.
Example of 12-tone row.

Process:

1) Build your own 12-tone row.
2) Using exclusively the pitches in the **order of your row**, compose a melody for solo viola that fulfills the guidelines.

Guidelines:

1) Requirements:
    a. Duration: eight measures.
    b. Meter: 7/4.
    c. Tempo: quarter note = 80.
    d. Use exclusively the pitches in the order of your row.
    e. All other parameters are free.
    h. Instrument: viola.
        i. The score should include all markings for articulations, dynamics, phrasing, bowings, and tempo. You must consider the instrument's range (see Appendix D).

17

Exercise 17: A 12-tone Row in Palindrome

In this exercise you will compose a melody for solo **violin** using a 12-tone row and its **retrograde** (i.e., read the row from the last to the first pitch).

Process:

1) Build your own 12-tone row.
2) Using exclusively the pitches in the order of your row, compose a melody for solo violin that fulfills the guidelines and employs a 12-tone row and its retrograde (Figure 1.22).

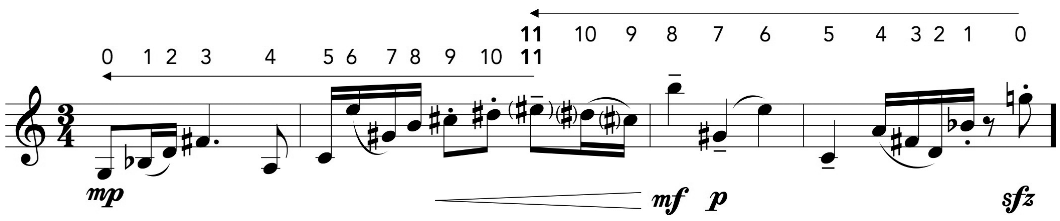


Figure 1.22. Example of 12-tone row and its retrograde.

Guidelines:

1) Requirements:
   a. Duration: free.
   b. Meter: 5/4.
   c. Tempo: quarter note = 70.
   d. Form: palindromic. First use exclusively the pitches in the order of your row (0 to 11). After you have gone through all 12 pitches, read the row backward (from 11 to 0). Note that the pitch located in slot 11 is at the same time the end of your row and the beginning of its retrograde.
   e. All other parameters are free.
   f. Instrument: violin.
      i. The score should include all markings for articulations, dynamics, phrasing, bowings, and tempo. You must consider the instrument's range (see Appendix D).

18

Exercise 18: Intervallic Content

In this exercise you will compose a melody for solo **clarinet** using the intervallic content of a given melody.

Process:

1) Analyze and create an inventory of ALL the intervals present in the melody given in Figure 1.23.

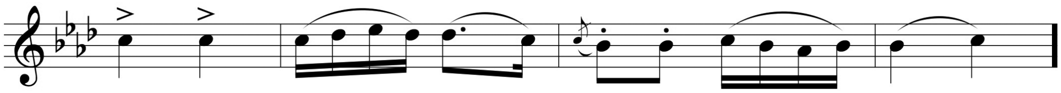


Figure 1.23. Franz Schubert, *Moments Musicaux*, No. 3 (excerpt).

Inventory of intervals: six repeated notes, one ascending minor second, one descending minor second, four ascending major seconds, four descending major seconds.

2) Using exclusively the intervals found in the given melody, compose a melody. You can start on any pitch (Figure 1.24).

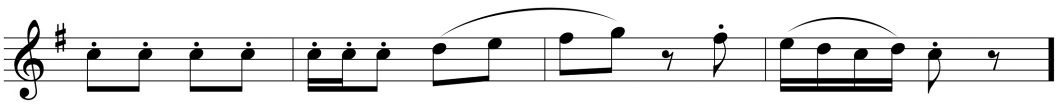


Figure 1.24. Possible solution using the intervals from the excerpt in Figure 1.23.

Guidelines:

1) Requirements:
   a. Duration: free.
   b. Meter: 2/4.
   c. Tempo: quarter note = 90.
   d. All other parameters are free.
   e. You can use any of the melodies contained in Appendix C.
   f. Instrument: clarinet.
      i. The score should include all markings for articulations, dynamics, phrasing, bowings, and tempo. You must consider the instrument's range and transposition (see Appendix D).

19

Exercise 19: Using Melodic Motifs

In this exercise you will compose a melody for solo **trumpet** using ***melodic motifs.*** A ***melodic motifs*** can be a short musical idea associated with a particular person, concept, or image. They are "sonic characters" with defined personalities given by their rhythmic, intervallic, and register components.

Process:

1) Write your own two motifs and choose two from the ones given in Figure 1.25.
2) Compose a melody that combines ALL four motifs in three possible ways:
   a. The last pitch of a motif is the first one of the next one (in this situation you will have to transpose carefully).
   b. All motifs appear non-transposed, with their original pitches.
   c. A combination of the two previous processes, where sometimes the motifs appear transposed and sometimes with their original pitches.

Guidelines:

1) Requirements:
   a. Duration: free.
   b. Meter: 6/8.
   c. Tempo: eight note = 100.
   d. All other parameters are free.
   e. In your score indicate tempo, articulations, dynamics, mutes, and breath marks.
   f. Consider the register of the instrument and its transposition. Complete your work in transposed score.

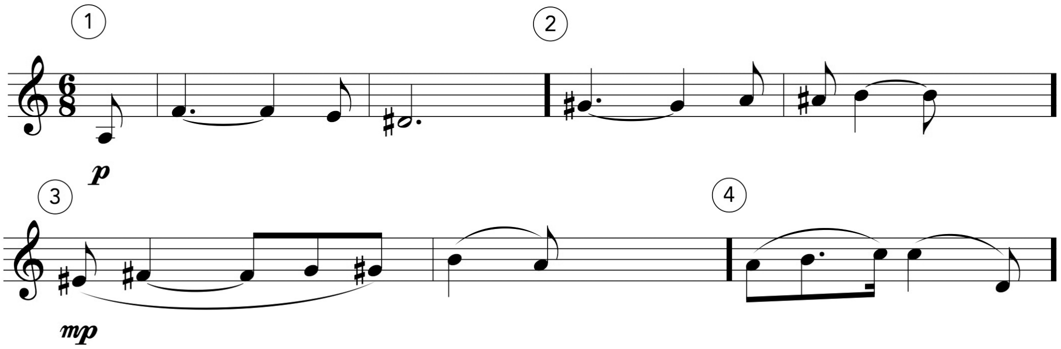


Figure 1.25. Selection of melodic motifs from the Prelude of *Tristan and Isolde* by Richard Wagner.

20

Exercise 20: Eliminations

In this exercise you will compose a melody for solo **flute** applying processes of elimination. In the eliminations, you can substitute a note with a rest or with a tie from a given passage. The rest simply substitutes pitches with silence, the tie prolongs a note over the ones that are eliminated.

Process:

1) Choose a passage to use as a foundation (Figure 1.26).

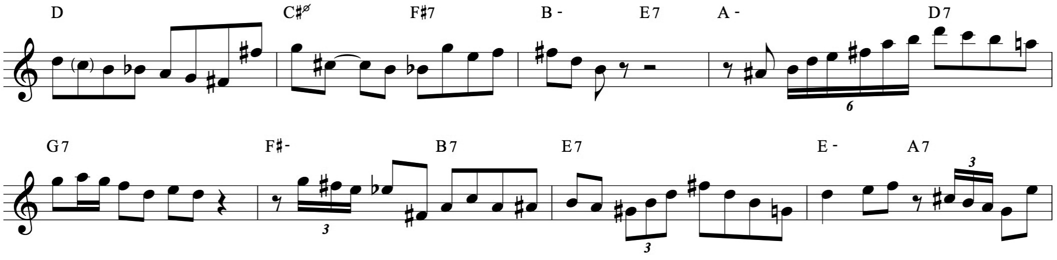


Figure 1.26. Excerpt from Charlie Parker's solo in *Confirmation.*

2) Transform it, applying eliminations using rests (Figure 1.27).

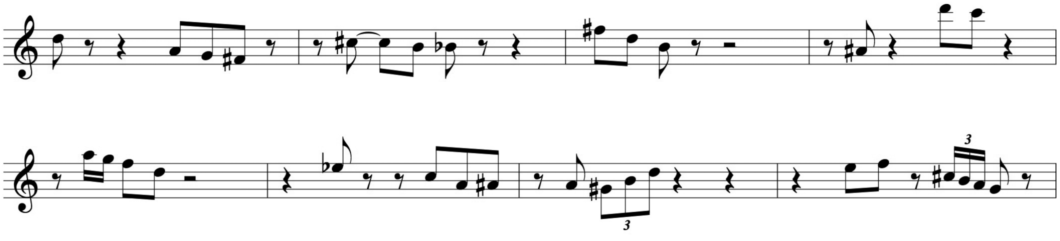


Figure 1.27. Transformation of Parker's solo using rests.

3) Or transform it using ties (Figure 1.28).

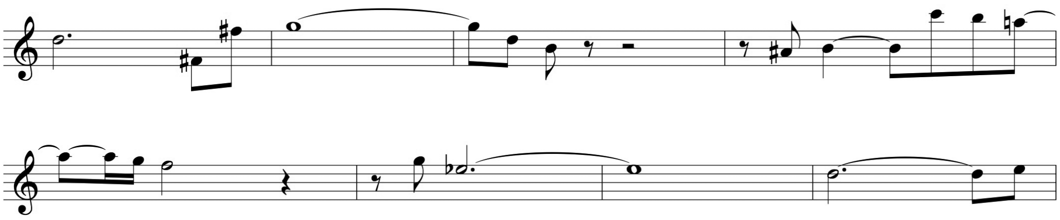


Figure 1.28. Transformation of Parker's solo using ties.

Guidelines:

1) Requirements:
    a. Duration: should match the duration of the chosen excerpt.
    b. Meter: 4/4.
    c. Tempo: quarter note = 120.
    d. Use Charlie Parker's solo (Figure 1.26). If you decide to apply the eliminations to a different excerpt, provide a copy of it.
    e. All other parameters are free.

2

Harmony (Exercises 21–40)

Preliminary Notes

This chapter focuses on sounds that occur simultaneously. The concept of *harmony* here is broad and has a far-reaching scope; it includes functional and non-functional harmonies, color, and any other approach to simultaneous sonorities. The results of the frameworks contained in this chapter can be reused in other exercises of the book.

Writing and understanding harmonies can be influenced by a number of factors. This non-exhaustive list proposes points for reflection that can help composing and guide the listening:

1) Environment: harmonies within a major or minor key are organized hierarchically where the tonic (degree I) and the dominant (degree V) are the two *central* chords.
2) Distribution of the voices: the sound of the same pitch collection can change depending on the way it is presented in the "vertical" domain. Important aspects to consider are the space between the voices and the distribution of those voices.
3) Register: the register in which the harmonies appear can influence the way they are perceived (e.g., smaller intervals are harder to discern in the extreme low register).
4) Upper and lower voices: the relationship between the soprano and bass lines in a texture can have a higher relative importance than the inner voices.
5) Dynamics and duration: similarly to the relative importance of the notes of a melody, duration and dynamics can make a difference in the harmonic domain. Longer or louder harmonies can be perceived as being more important.
6) Parallelism: one of the features of the music of Debussy is the use of familiar elements (e.g., dominant seventh chords) in an unfamiliar way (e.g., dominant seventh chords that do not resolve but move in parallel, D7–C♯7–C7–B7). Harmonies that move in parallel can be a useful resource.
7) Voice leading: the way in which the individual voices move is an important aspect to consider when composing harmonies. If the voices move stepwise (see exercise 21), the harmonies can be extremely chromatic and move freely with smooth transitions. The result can be different with an "angular" voice leading where the voices mainly move by large leaps.

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8) Melodies that overlap: harmonies can be the result of melodies placed on top of each other without any other consideration. Two or more overlapping melodies composed using the same collection of pitches can generate a myriad of resulting harmonies.
9) Number of voices and doublings: the number of voices and the choice of doublings can influence how the harmonies are perceived (e.g., an F–A♭–C chord in a five-voice setting with three voices doubling the C is different from the same F–A♭–C chord in a five-voice setting with the A♭ doubled instead of the C).
10) Orchestration: the instrumental forces chosen to orchestrate a passage of a composition can have a crucial influence on its harmony. Range, blend, dynamic, and voicing possibilities are only a few of the factors that vary depending on the instruments involved.

This list proposes a variety of aspects that can be considered while solving the exercises contained in this chapter or used for further reflection.

Exercise 21 suggests the implementation of voice leading as a constructive principle through stylistic imitation. Number 22, in which "melody becomes harmony," proposes the harmonization of a melody using exclusively its pitch content. Exercise 23 incorporates symmetrical harmonies; 24 and 25 use the harmonic series to create harmonies. In 26 the harmonies are built around major and minor triads with pitches in common. Exercise 27 incorporates the use of integer notation; 28 uses scale degrees but *not* triads. The base of exercise 29 is the 12-tone row; 30 uses the concept of "circle" progression or harmonies that move around the circle of fifths; 31 and 32 incorporate harmonies that move in major and minor thirds; 33 and 34 discuss overlapping triads and polytonality; 35 provides an opportunity to work with pedal tones; 36 incorporates the church modes and 37 the use of clusters (i.e., harmonies based exclusively on minor a major seconds). Exercise 38 is based on harmonic sequences; 39 and 40 discuss implied harmonies and writing "contrafacts."

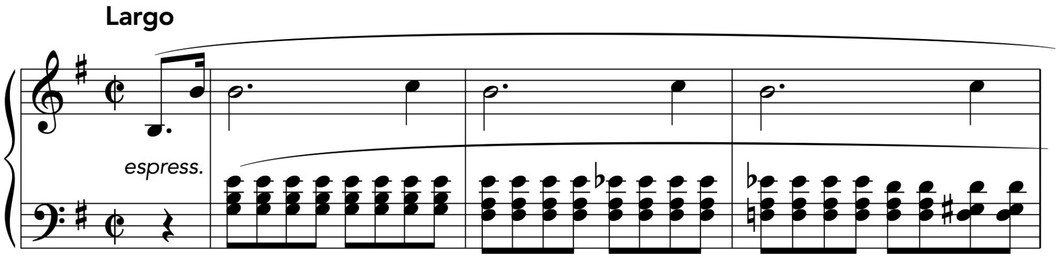
Exercises

21

Exercise 21: Composing Transitions

For this exercise (Figure 2.1), you will create a harmonic progression using Frédéric Chopin's *Prelude No 4 in E minor* as a model. The objective of the assignment is to help you compose *transitional* material to link *structural* chords based on thirds (i.e., triads).

Figure 2.1. Frédéric Chopin, Prelude in E minor No. 4 (excerpt).



Guidelines:

1) Instrument: piano.
2) Duration: between 15 and 25 chords.
3) Texture: use a texture modeled after the piano Prelude No 4 in E minor by Frédéric Chopin.

Process:

1) Choose three or four **structural** chords. You can make those choices following principles of functional harmony or just pick chords that you think work well in a harmonic progression.
2) Create a harmonic **transition** between those structural chords following the process shown in Table 2.1. Figure 2.2 shows one possible rendition of the transition chart into a four-part texture.

Table 2.1. Example transition chart from a C major triad in four voices to a D major triad.

	C major chord in four voices **(structural chord)**	**Transition** ***(the number of steps can vary if the structural chords have notes in common)***			*D major chord in four voices* **(structural chord)**
		three notes of C one note of D	*two notes of C two notes of D*	*one note of C three notes of D*	
Voice 1	C	D	D	D	D
Voice 2	G	G	A	A	A
Voice 3	E	E	E	E	F♯
Voice 4	C	C	C	D	D

* White = pitches from structural chord C major; gray = pitches from structural chord D major.

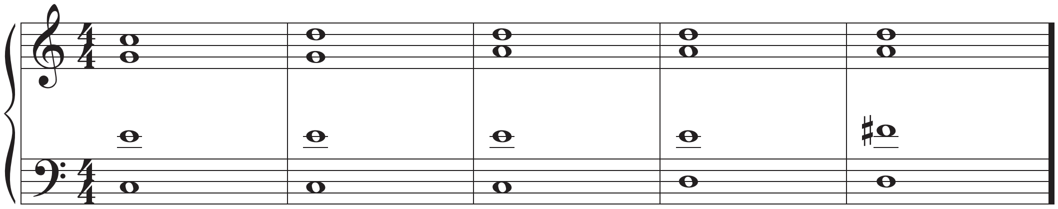


Figure 2.2. Possible rendition of the transition chart to a four-part piano texture.

22

Exercise 22: Using Segments, Melody Becomes Harmony

For this exercise, you will harmonize a melody following the given constraints. The objective of this assignment is to help you harmonize a melody using exclusively its pitch content. The underlying harmonies are strictly based on pitch segments extracted from the melody. In this exercise the **melody *becomes* harmony**.

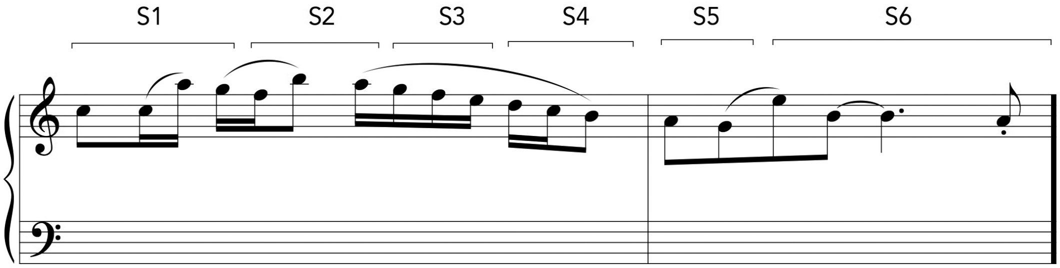
Guidelines:

1) Instrument: piano.
2) Duration: one chord per segment of the melody (this will be clarified in the explanation of the process).
3) Texture: homophonic (i.e., the given melody in the right hand + the harmonic accompaniment in the left hand).

Process:

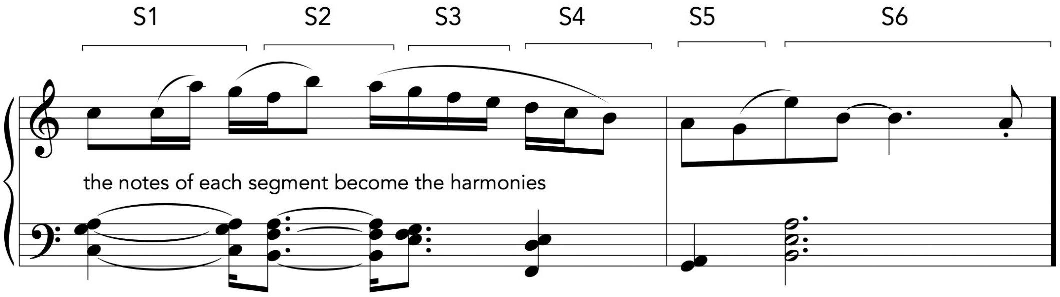
1) On the given melody, create segments of two or three pitches (Figure 2.3).

Figure 2.3. Given melody with segments of unequal duration.



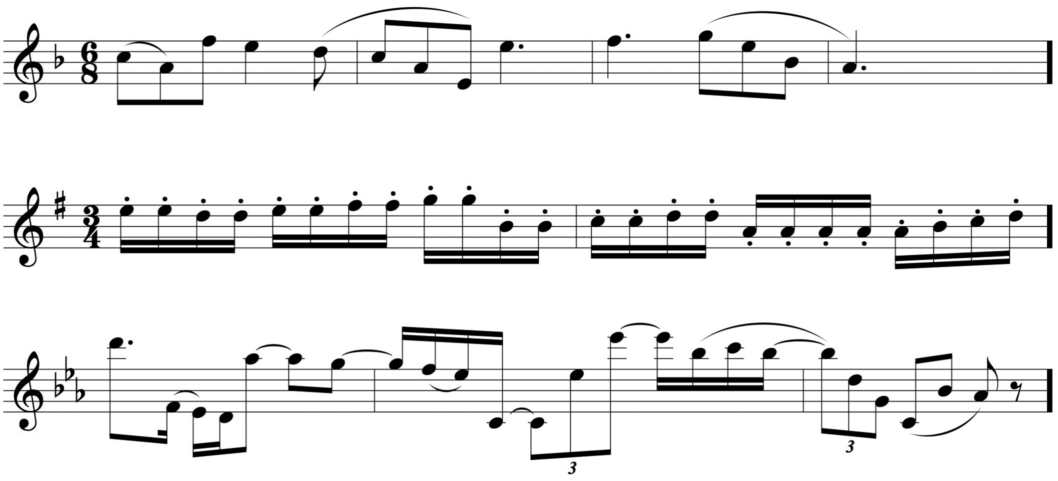
2) Using only the notes of your segments in any register, create the harmonies (in block chords) to accompany the given melody (Figure 2.4).

Figure 2.4. Melody harmonized with the notes of the segments.



For this exercise you can use any of the melodies in Figure 2.5 or choose one from Appendix C.

Figure 2.5. Suggested melodies for harmonization.



23

Exercise 23: Axis of Symmetry

For this exercise, you will create **symmetrical** harmonies around an **axis**. The symmetry should be calculated in semitones (i.e., the voices above and below the axis should be at the *same distance* in semitones).

Guidelines:

1) Instrumentation: violin trio. Violin II should have the given melody or the melody that you will consider as axis.
2) Duration: length of the melodic line used as axis.
3) Texture: homorhythmic (i.e., all voices should move with the same rhythm). **Use only ONE note above and ONE note below the axis.**
4) All other parameters are free.

Process:

1) Choose or compose a simple melody that will be used as axis and assign it to the violin II (Figure 2.6).

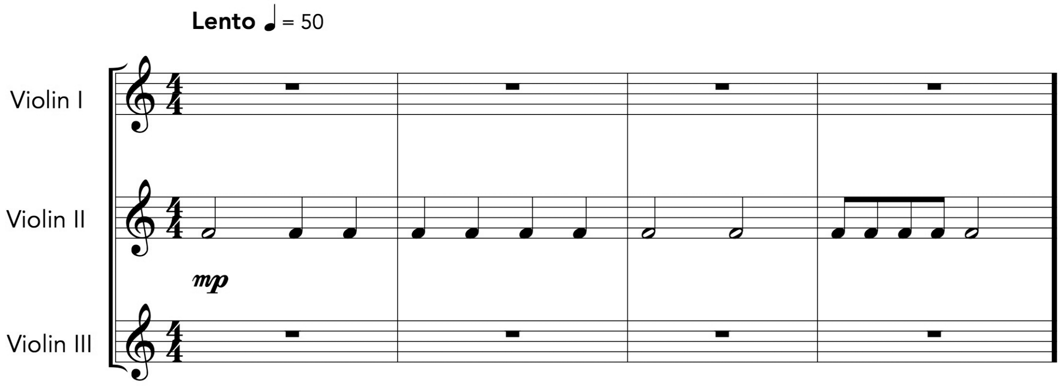

Lento ♩ = 50
Violin I
Violin II
mp
Violin III

Figure 2.6. Axis of symmetry in violin II.

2) Using the rhythm of the melody, create harmonies that are symmetrical around the axis (remember only one voice above and one below). The upper voice should be the **same number of semitones** from the axis as the lower one (Figure 2.7).

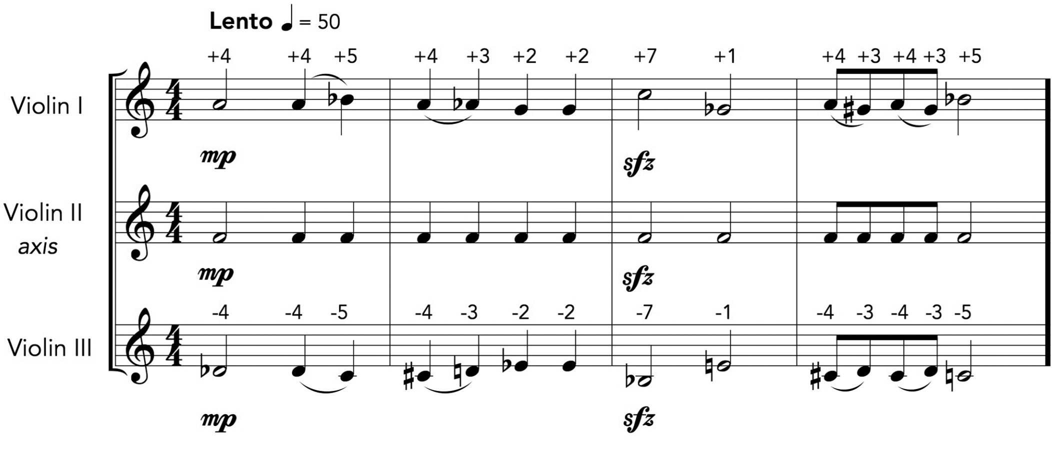
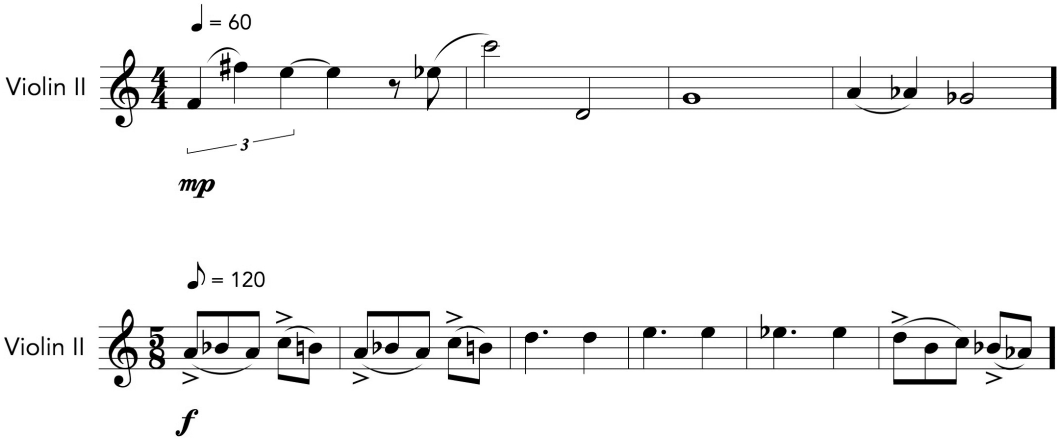

Lento ♩ = 50
+4 +4 +5 +4 +3 +2 +2 +7 +1 +4 +3 +4 +3 +5
Violin I
mp
sfz
Violin II
axis
mp
sfz
-4 -4 -5 -4 -3 -2 -2 -7 -1 -4 -3 -4 -3 -5
Violin III
mp
sfz

Figure 2.7. Symmetrical harmonies around the given axis.

For this exercise you can use the given melody of the example, the one from Figure 2.8, or choose one from Appendix C.

Figure 2.8. Melody for axis of symmetry.

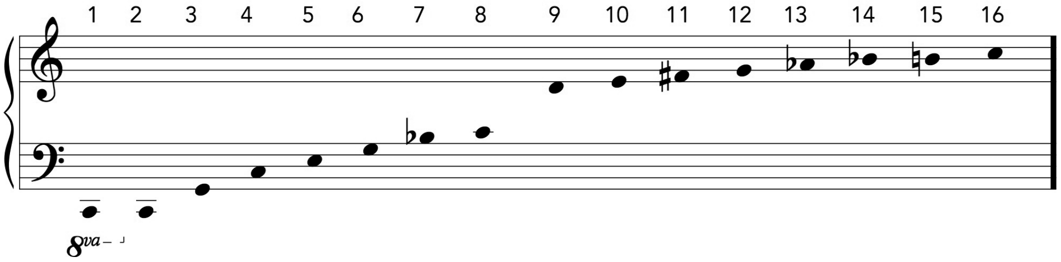

♩ = 60
Violin II
3
mp
♪ = 120
Violin II
f

24

Exercise 24: Using the Harmonic Series

For this exercise, you will create harmonies based on the first 16 overtones of the **harmonic series** on a C fundamental. A harmonic series (Figure 2.9) is the sequence of sounds in which the frequency of each sound is an integer multiple of the fundamental, the lowest frequency.

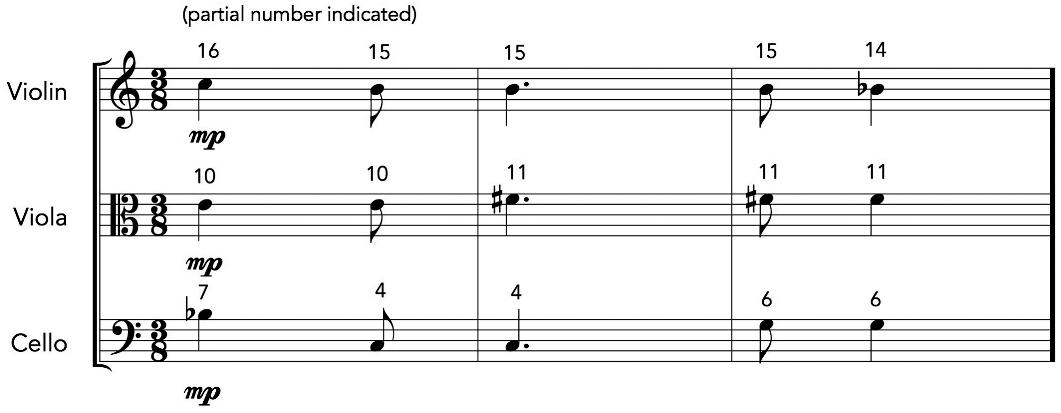
Figure 2.9. Harmonic series on a C fundamental.


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
8va

Guidelines:

1) Instrumentation: string trio (violin, viola, and cello).
2) Create between 10 and 14 block harmonies that use pitches coming exclusively from the harmonic series on a C fundamental.
3) Use only three pitches per harmony and **keep the register** in which those pitches appear in the harmonic series. See a possible solution in Figure 2.10.
4) Meter, tempo, and all other parameters are free.

Figure 2.10. Possible solution to exercise 24 with partial numbers indicated.


(partial number indicated)
Violin
16
15
15
15
14
mp
Viola
10
10
11
11
11
mp
Cello
7
4
4
6
6
mp

25

Exercise 25: Using the Harmonic Series with a Pedal Tone

For this exercise, you will create four-part block harmonies for solo **piano** based on the first 16 overtones of the **harmonic series** on a C fundamental (refer to the harmonic series presented in exercise 24).

Guidelines:

1) Instrument: piano.
2) Create between 12 and 14 block harmonies that use pitches coming exclusively from the harmonic series on a C fundamental.
3) One of those voices must remain static on the same pitch when the other ones move around it (Figure 2.11).
4) All other parameters are free.

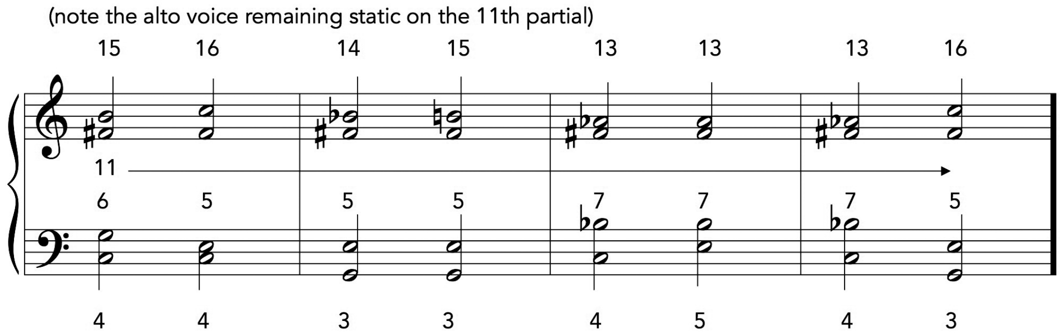


Figure 2.11. Possible solution to exercise 25 with partial numbers indicated.

26

Exercise 26: Just Triads

For this exercise, you will create four-part block harmonies for solo **piano** using exclusively major and minor triads with one pitch in common (Figure 2.12).

Guidelines:

1) Instrument: piano.
2) Create between 12 and 14 block harmonies that exclusively use major and minor triads.
3) The triads must have at least one note in common (i.e., when moving from one triad to the other, one of the voices will necessarily remain on the same pitch).
4) You can choose to duplicate any note of the triad.
5) All other parameters are free.

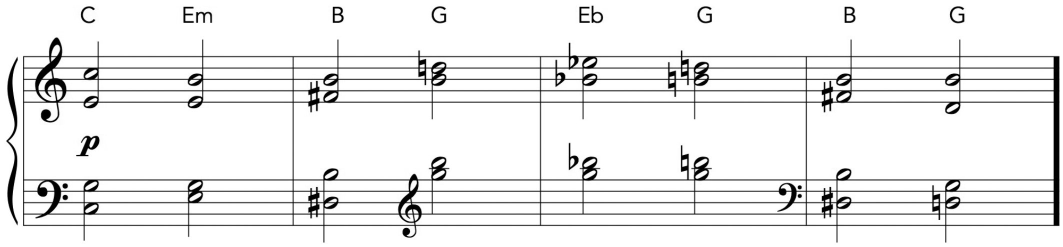


Figure 2.12. Possible solution to exercise 26.

27

Exercise 27: Using Integer Notation

In this exercise you will compose a series of harmonies for **cello quartet** using integer notation. Integer notation is the translation of pitches into whole numbers (Figure 2.13).

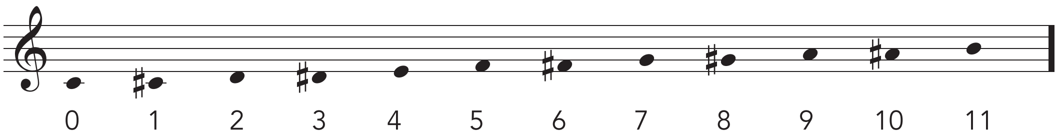


Figure 2.13. Chromatic scale translated into whole numbers.

Process:

1) Generate a sequence of four numbers between 0 and 11. For this sequence you can apply a variety of sources (e.g., dates of birth of close friends, phone numbers, dates, etc.).
2) After you have the sequence, assign it to pitches (one per instrument) according to the image. The pitches can appear in any register (e.g., 0 equals all Cs in any register).
3) Repeat steps 1 and 2 recursively.
4) A simple example would be: 0245 → C D E F.

Guidelines:

1) Using integer notation as source, compose a series of four-part block harmonies that fulfill the following requirements:
    a. Duration: between 14 and 16 block harmonies.
    b. Meter and tempo are free.
    c. Texture: homorhythmic (all four voices move with the same rhythm).
    d. Instrumentation: cello quartet.
    e. The score should include all markings for articulations, bowings, dynamics, phrasing, and tempo.
    f. You must consider the instrument's range (see Appendix D).

28

Exercise 28: Diatonic?

For this exercise, you will create four-part block harmonies for solo **piano** based on the scale degrees of a major scale. Those scale degrees will be based on each of the notes of the major scale, will only use its pitches, and will be labeled I to VII but they *will not be triads*. Instead, they will be built following an original process.

Process:

1) Label the scale degrees of any major scale from I to VII (Figure 2.14).

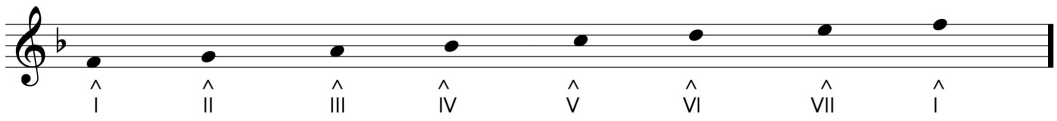


Figure 2.14. Degrees of a major scale.

2) Create a simple process and apply it to every scale degree to generate all the harmonies. In Figure 2.15, the harmonies have three notes: scale degree + next pitch of the scale + skip one note of the scale. These processes are arbitrary; you can create your own and apply it to all the scale degrees.

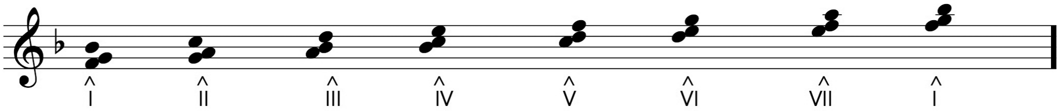


Figure 2.15. Harmonies on scale degrees.

Guidelines:

a. Instrument: piano.
b. Create between 12 and 14 block four-part harmonies that exclusively use the harmonies that you created using the preceding process. Avoid triads!
c. You can choose to duplicate any note in the texture.
d. All other parameters are free.

29

Exercise 29: A 12-tone Row

For this exercise, you will create three-part block harmonies for solo **vibraphone** based on subsets of a given 12-tone row. A 12-tone row is a series that contains all 12 pitches (without repetitions) in a particular order.

Process:

1) Create a 12-tone row and label it (Figure 2.16).

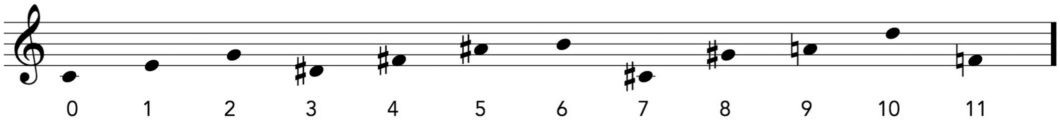


Figure 2.16. 12-tone row.

2) Create three-part harmonies by combining the adjacent pitches in the row (in subsets of three; Figure 2.17).

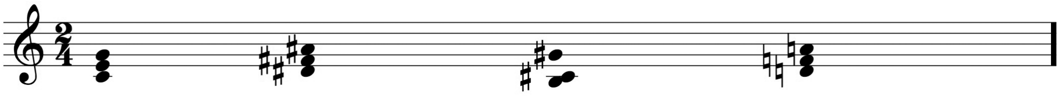


Figure 2.17. Three-part harmonies extracted from the row.

Guidelines:

a. Instrument: vibraphone.
b. Create 16 block three-part harmonies that exclusively use the segments of the row. The register distribution of the pitches is free.
c. Tempo is free.
d. In the score include dynamics, articulations, pedal markings, and mallets.
e. The rhythmic structure should come from the excerpts contained in Figure 2.18.

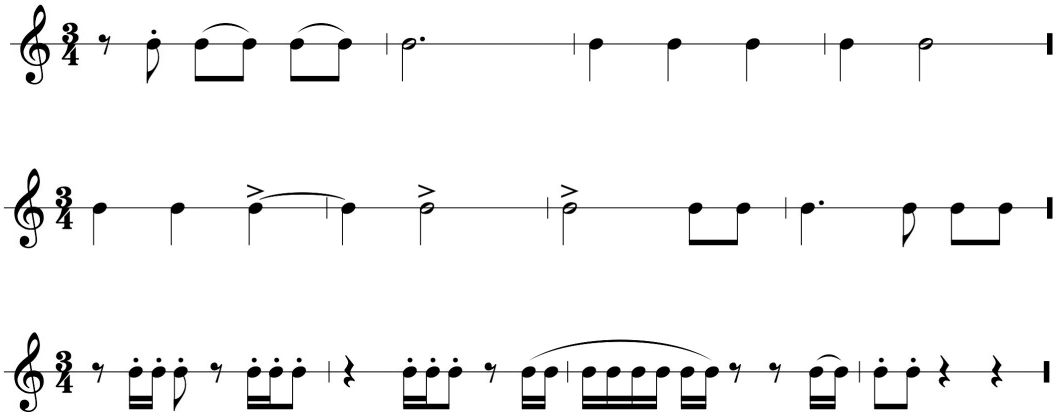


Figure 2.18. Rhythmic material for exercise 29.

f. All other parameters are free.

30

Exercise 30: "Circle" Progression

For this exercise, you will compose harmonies that move in ascending fourths or descending fifths following the ***circle of fifths***. For this exercise you will use only major and minor triads.

Process:

1) Start on any triad (major or minor).
2) The next triad will be an ascending fourth or a descending fifth apart from the first one.
3) Voice leading: move the voices as little as you can, keep the common tones when possible. The slash refers to the bass note (e.g., Fm/C indicates an F minor triad with C in the bass—see Figure 2.19).

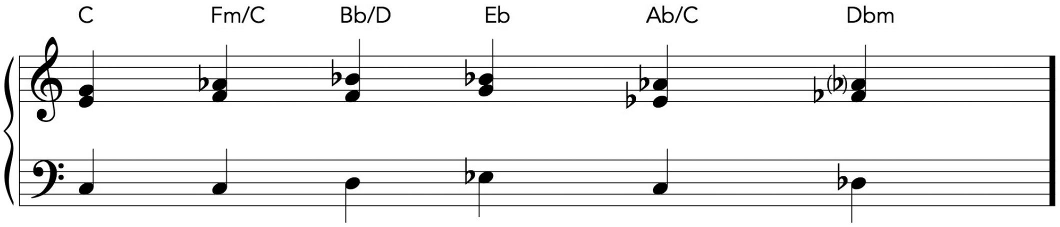


Figure 2.19. Possible solution to exercise 30.

4) Repeat steps 2 and 3 recursively.

Guidelines:

1) Instrument: solo piano.
2) Duration: eight measures.
3) Meter: 3/8. Use a waltz texture.
4) Tempo: eight note = 132.
5) All parameters are free. Remember to indicate in your score tempo, dynamics, articulations, and pedal indications.

31

Exercise 31: Triads That Move in Thirds

For this exercise, you will compose harmonies (only major and minor triads) whose **roots move in ascending or descending major or minor thirds** (as in Figure 2.20). These relationships between triads that are a third apart are also called "mediant relationships." It is important to mention that both major and minor thirds divide the octave in equal parts, therefore limiting the amount movements before the triads start to repeat.

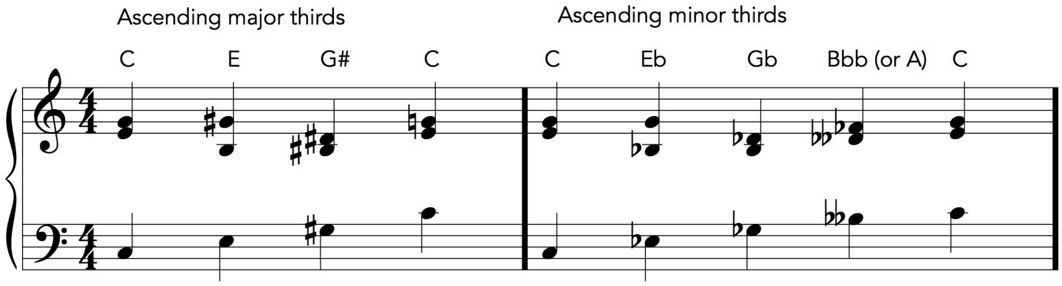


Figure 2.20. Harmonic progressions in major and minor thirds.

Guidelines:

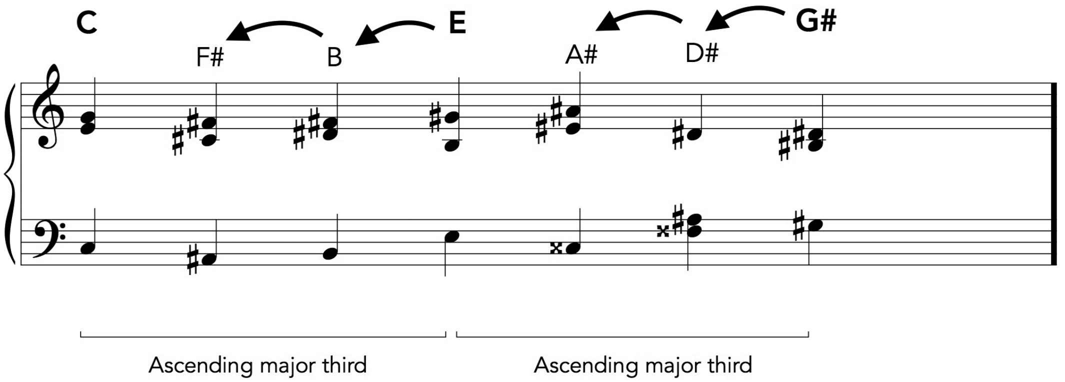
1) Instrument: marimba.
2) Duration: 8–10 triads.
3) Meter: 5/4.
4) Tempo: quarter note = 60.
5) Voice leading: make an effort to write "interesting" melodies for all the independent voices.
6) Use the same interval in the same direction at least four times before changing (e.g., move four major thirds up, then four minor thirds down, then six major thirds up, etc.).
7) Consider the register of the instrument. In the score provide articulations, dynamics, tempo, meter, and mallets.
8) All other parameters are free.

32

Exercise 32: Triads That Move in Thirds and Progressions within a Progression

For this exercise, you will compose **harmonies around structural triads that move in ascending or descending major or minor thirds**. Here you can use a solution to exercise 31 as your starting point or create a new set of triads that move following the rules of exercise 31. The structural triads move in thirds; the harmonies that you will create will target those triads following the *circle of fifths* as explained in exercise 30. For example, if we consider the movement between C and E, the latter chord E would be the target approached with harmonies following the circle of fifths. That would result in C–***F♯***–***B***–E because E is a fifth apart from B and F♯ is a fifth apart from B (Figure 2.21).

Figure 2.21.
Fifths within thirds.



Guidelines:

1) Instrument: piano.
2) Duration: 8–10 triads.
3) Meter: 5/4.
4) Tempo: quarter note = 60.
5) Voice leading: make an effort to move to the next triad smoothly, moving the voices very little and keeping the common tones when possible.
6) In your score indicate articulations, dynamics, tempo, meter, and pedal.

33

Exercise 33: Polychords, Triads over Triads

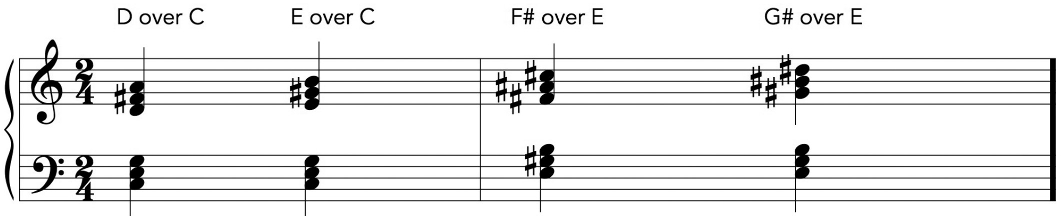
For this exercise, you will compose and explore different combinations and sonorities of **block harmonies** that juxtapose two different triads. These harmonies explore sonority and color, not necessarily a functional progression.

Guidelines:

1) Instrument: piano.
2) Duration: 15–20 block harmonies.
3) Meter: 6/8.
4) Tempo: dotted quarter note = 60.
5) Do not cross voices (i.e., the right hand must always be above the left hand).
6) Use exclusively major and minor triads.
7) All other parameters are free.

Consider Figure 2.22.

Figure 2.22.
Triads over triads.



34

Exercise 34: Polytonality

For this exercise, you will explore **polytonality**, in which melody and harmony are in different keys. In *Corcovado (Saudades do Brasil)* by Darius Milhaud, the composer suggests the coexistence of two different keys (Figure 2.23).

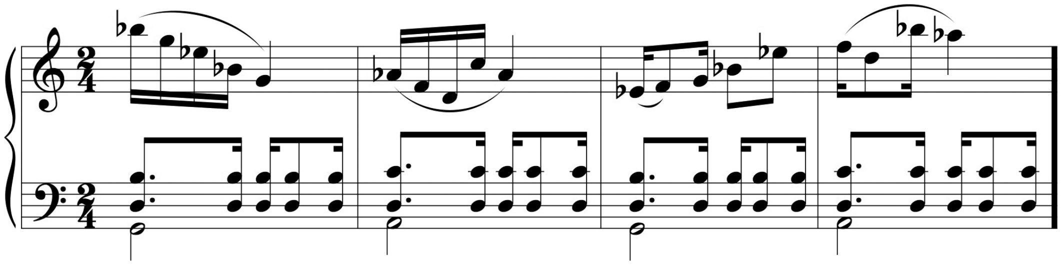


Figure 2.23.
Corcovado from *Saudades do Brasil* by Darius Milhaud (excerpt).

Process:

1) Analyze the excerpt by Darius Milhaud. Which are the harmonies of the right and left hands? How are those harmonies related? What is the overall resulting sonority?
2) Create two overlapping progressions in different keys.

Right hand E♭ Fm E♭ B♭7
Left hand G Am G Am

3) Write a short piano excerpt after it in which both hands are in different keys.

Guidelines:

1) Instrument: piano.
2) Duration: eight to ten measures.
3) Meter: 7/8.
4) Tempo: eighth note = 120.
5) Do not cross voices (i.e., the right hand must always be above the left hand).
6) All other parameters are free.

35

Exercise 35: Pedal Tones

For this exercise, you will explore the use of **pedal tones.** A pedal tone or pedal point is a note that sustains while the other voices move. It can appear in a variety of ways and registers, but it is commonly found in the bass. Some examples of how pedal tones work can be found in the beginning of the first movement of Johannes Brahms's Symphony No. 1, Maurice Ravel's *Le Gibet*, or the jazz standard *On Green Dolphin Street* by Bronisław Kaper and Ned Washington.

Process:

1) Choose one of the given progressions and voice it in four parts.
2) Choose the lowest note of the first chord and hold it until the last chord.

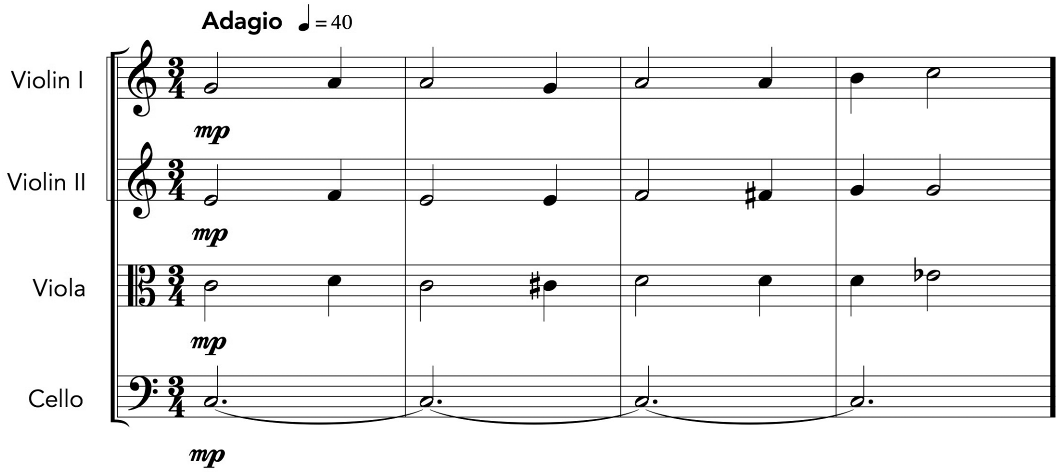

Adagio ♩= 40
Violin I
Violin II
Viola
Cello
mp

Figure 2.24. Example of pedal tone.

Guidelines:

1) Instrument: string quartet.
2) Duration: 10–12 measures.
3) Given progressions:
    a. C Dm Am A Dm D G Cm (see Figure 2.24).
    b. Fm Go A♭ C C A♭ Ao B♭m Gm.
    c. Gm D F♯o B Em E♭o D Gm.
    d. A F♯m Bm E G♯ A E A.
4) In your score indicate tempo, articulations, bowings, character, and dynamics.
5) All other parameters are free.

36

Exercise 36: Ideas Using Parallel Modes

For this exercise, you will explore harmonies using parallel **church modes** (i.e., Ionian, Dorian, Phrygian, Lydian, Mixolydian, Aeolian). Parallel modes are built starting on the same pitch (Figure 2.25).

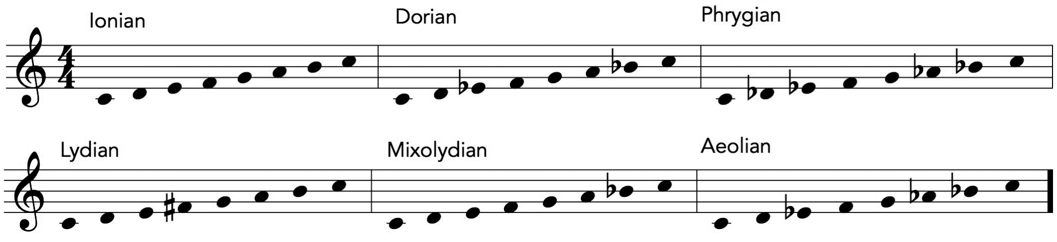

Ionian
Dorian
Phrygian
Lydian
Mixolydian
Aeolian

Figure 2.25. Church modes.

Process:

1) Create ALL the scale degrees in triad form for ALL the modes (practice this step on a variety of pitches) (Figure 2.26).

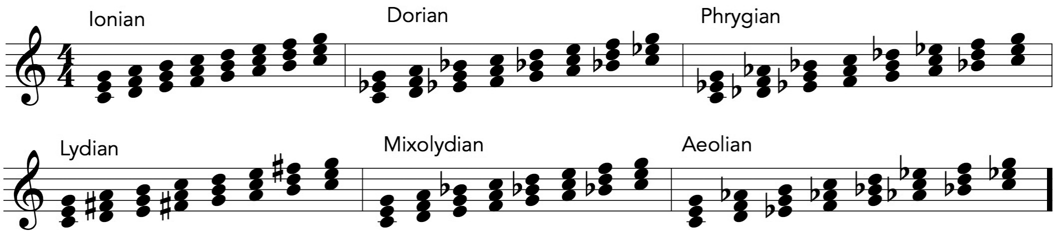


Figure 2.26. Parallel church modes with triads.

2) Choose a simple progression from the given ones and harmonize it three times using different parallel modes.

Guidelines:

1) Instrument: French horn trio.
2) Duration: four to five measures.
3) In your score indicate dynamics, articulations, breath marks, mutes, and tempo. Consider the register and transposition of the instrument. Your score should be transposed.
4) Given progressions (the Roman numerals indicate the scale degrees):
   a. I VI II V I.
   b. I III VI IV V I.
   c. I IV V VI.
   d. I III VI II V I.

37

Exercise 37: Clusters

In this exercise you will explore the use of **clusters**. A cluster is usually defined as a group of three or more adjacent pitches separated by whole or half steps. In any cluster, we can control its **internal distribution** of whole and half steps and its **span** (i.e., the interval between its lowest and highest pitches).

Process:

1) Determine the span of the clusters (M3, P4, m3, P4) (Figure 2.27).

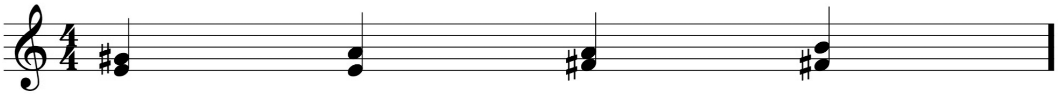


Figure 2.27. Span of clusters.

2) Fill the clusters with half steps and whole steps (Figure 2.28).

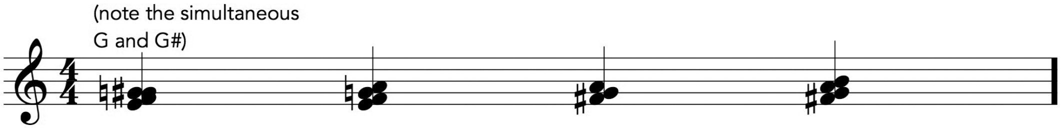


Figure 2.28. "Filled" clusters with major and minor seconds.

3) Write a "melody" line using exclusively the notes contained in the cluster (Figure 2.29).

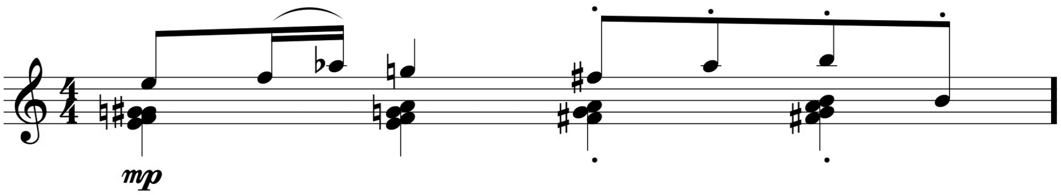


Figure 2.29. "Filled" clusters with melody line.

Guidelines:

1) Instrument: piano.
2) Duration: six measures.
3) Determine the span of the clusters, then "fill" them with whole and half steps exclusively. Write a melody using only the notes of the cluster.
4) Tempo: quarter note = 52.
5) Meter: 3/4.
6) Rhythm and other parameters are free. Remember to include in your score the indications of tempo, dynamics, articulations, and pedal.

38

Exercise 38: Sequences and Patterns

In this exercise you will explore the use of **harmonic sequences**. A sequence is the repetition of a pattern (or segment). If we have a simple pattern that involves scale degrees 1 3 4, then a sequence that uses that pattern would be: 1 3 4, 3 5 6, 2 4 5, 4 6 7.

Process:

1) Label all the degrees (in this case triads) of a scale (Figure 2.30).

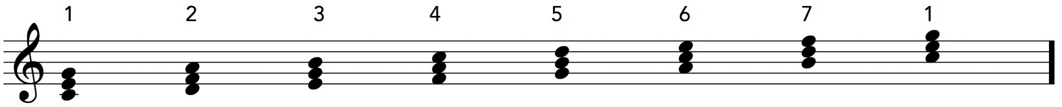


Figure 2.30. Labeled scale degrees.

2) Create a pattern or segment of any length with a minimum of three elements (e.g., 1 3 4 or 1 4 5 2).
3) Apply it to create a harmonic sequence (Figure 2.31). Consider using the scale degrees from exercise 36.

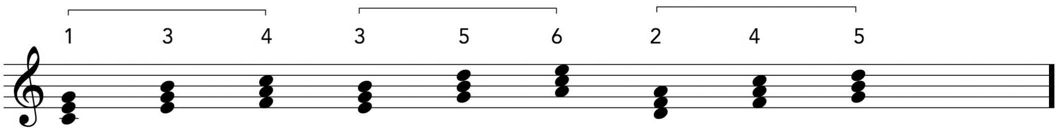


Figure 2.31. Scale degrees in a sequence.

Guidelines:

1) Instrument: piano.
2) Duration: four iterations of the pattern.

3) In your score indicate tempo, dynamics, articulations, and pedal markings. Also, mention the pattern that you employed (e.g., 1 3 4 7).
4) Use only block chords in three parts.
5) You can choose to use the modal scale degrees from exercise 37.
6) All other parameters are free.

39

Exercise 39: Implied Harmonies

In this exercise you will explore the use of a melody to imply harmonies. We know that harmony—in the broadest sense—is the sound of two or more pitches simultaneously. However, harmonies can also be implied when the pitches of a given harmony are presented in succession. In Figure 2.32, we can see how the block harmonies (below) can be implied melodically (above).

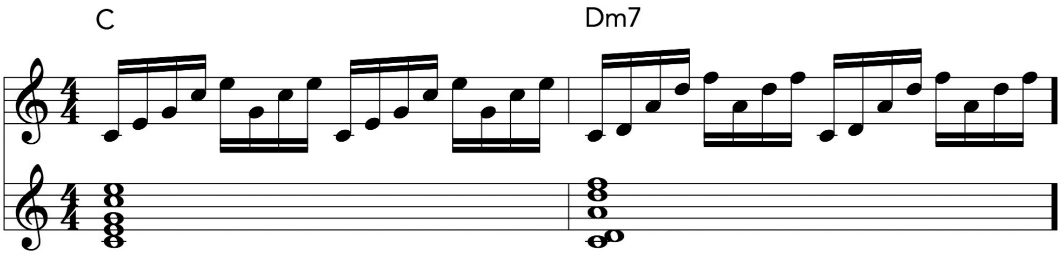


Figure 2.32. Melodic excerpt with implied harmonies.

Process:

1) Create a series of block harmonies using between three and five pitches in each block. The example in Figure 2.33 shows triadic blocks only as demonstration; any block harmony can be used. Harmonies created in previous exercises in this chapter are strongly encouraged.

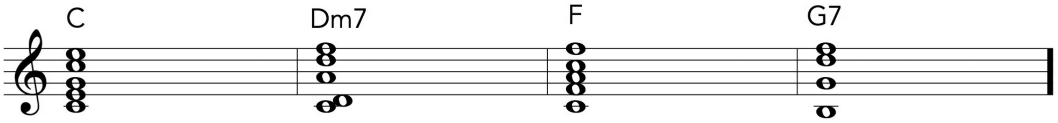


Figure 2.33. Block harmonies.

2) Create a rhythmic structure (Figure 2.34). It is important to note in this step that the temporal proximity of the events is vital for the perception of the implied harmonies. If the rhythmic structure is too sparse, then the pitches will be perceived as isolated and not as a component of a harmonic block.

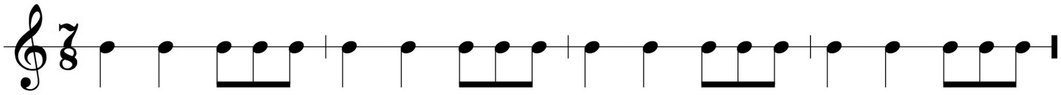
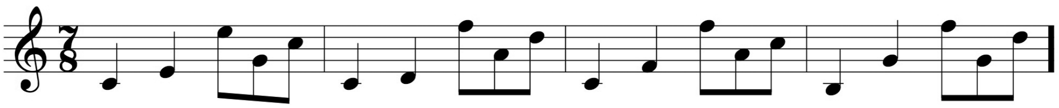


Figure 2.34. Rhythmic structure.

3) Combine the harmonies with the rhythmic structure that you created assigning one pitch per rhythmic figure (Figure 2.35).

Figure 2.35. Possible solution to exercise 39.



Guidelines:

1) Instrument: oboe.
2) Duration: two iterations of the harmonic blocks.
3) In your score indicate articulations, dynamics, tempo, breath marks, and character.
4) Mind the register of the instrument (see Appendix D).
5) Suggestion: you are encouraged to use solutions to previous exercises as source (in the rhythmic domain, in the harmonic domain, or both).
6) Meter: 7/8.
7) All other parameters are free.

40

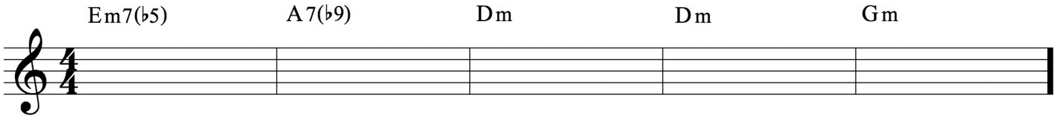
Exercise 40: Contrafacts

For this exercise, you will write a **contrafact.** In jazz, a contrafact is a musical composition consisting of a new melody overlaid on a familiar harmonic structure. Even though this exercise provides an example from the jazz literature, the concept of a contrafact can be understood broadly to include any use of a borrowed chord progression.

Process:

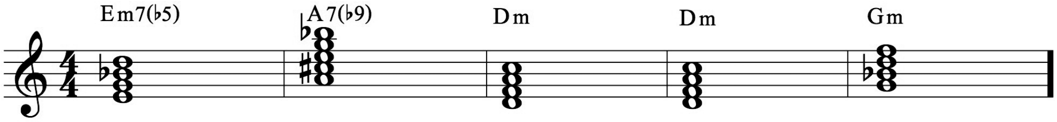
1) Extract the harmonic progression only of any jazz standard. Figure 2.36 shows the first five measures of *Beautiful Love* by Victor Young.

Figure 2.36. Harmonies for *Beautiful Love* (excerpt in lead sheet).



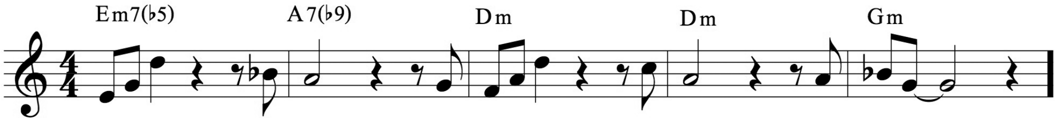
2) Using the harmonies given in Figure 2.37, write a melody that is guided by the pitches of the harmonies and that is different from the original.

Figure 2.37. Block harmonies for *Beautiful Love.*



3) New melodic line using the pitches from the original harmonic progression (Figure 2.38).

Figure 2.38. New melody composed with the pitches available from the block chords.



Guidelines:

1) Instrument: piano.
2) Duration: 16–18 measures.
3) Use a section of a jazz standard of your choice. Use *only* the pitches from the harmonic progression.
4) Present the score with indication of tempo, dynamics, articulations, and pedal markings. Write the new melody under the lead sheet symbol, a grand staff is not required.
5) All other parameters are free.

3

Rhythm (Exercises 41–60)

Preliminary Notes

Rhythm in this chapter is conceived as the pace at which music unfolds in time. Note values, rests, and other sources of rhythmic notation are a way to control the temporal evolution of a new composition. The outcomes of the exercises of this chapter can be reused in other chapters.

Exercise 41 proposes a series of simple mathematical transformations to given rhythmic structures; 42 and 43 use segments of equal and unequal length. Numbers 44 and 45 incorporate the concept of non-retrogradable rhythmic structures, the goal of 46 is to extract the rhythm of a given text using its syllables and accents, 47 uses groupings to generate meter, and 48 uses a Morse code translator to extract the durations from a given text. Exercise 49 brings back the concept of rhythmic ostinato; 50 and 51 employ hemiolas. Number 52 is based on the use of several time signatures simultaneously (polymeter), 53 incorporates metric modulations, and 54 uses rhythmic motifs as building blocks. Number 55 continues with the use of motifs, shifting them in time. The concepts of *talea* and *color* from isorhythmic motets are included in exercise 56. Looping and composing using repeat signs are included in number 57; 58 is about indeterminate pauses and fermatas. Rhythmic transformations using eliminations are at the core of 59; exercise 60 proposes an experimentation with the perception of pulse.

Exercises

41

Exercise 41: Transformations Using Simple Math

In this exercise you will **transform the rhythm** of the given melodies (see Figure 3.1) in three different ways employing simple mathematical operations.

1) **Add** the same rhythmic value (of your choice) to all the rhythmic figures of the melody. For example, adding an e to each figure would give you: q + e = q, and e + e = q.
2) **Subtract** the same rhythmic value (of your choice) to all the rhythmic figures of the melody. For example, subtracting an e to each figure would give you: q – e = e, and h – e = q.

Composing with Constraints. Jorge Variego, Oxford University Press. © Oxford University Press 2021. DOI: 10.1093/oso/9780190057237.003.0004

3) **Multiply** every rhythmic value of the given melody by the same factor (of your choice). For example, multiplying all figures by three would give you: q × 3 = h. and e × 3 = q.

After you have completed the transformations, you *can* choose to change the time signature. * Note: also apply the transformations to the rests.

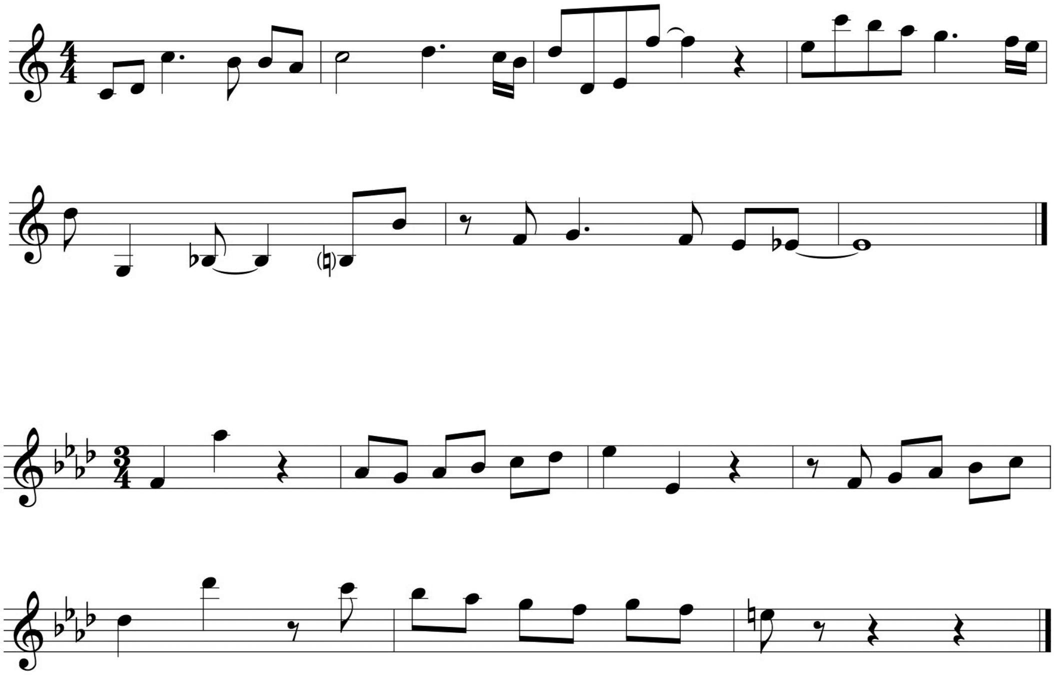


Figure 3.1. Melodies for rhythmic transformation.

42

Exercise 42: Using Segments

In this exercise you will **transform** the rhythmic structure of a melody using various **segments**.

Guidelines:

1) Instrument: tenor trombone (check its register in Appendix D).
2) Duration: the length should be the same as the original melody (the explanation of the process will clarify this point).

Process:

1) On the given melody (Figure 3.2), create segments of any length.

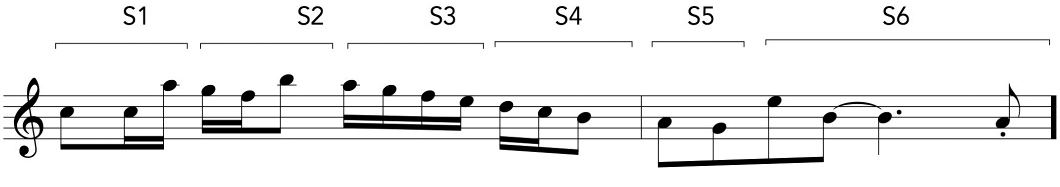


Figure 3.2. Segmented melody.

2) Without altering the pitches in any way, scramble the rhythm of the different segments that you created (Figure 3.3).

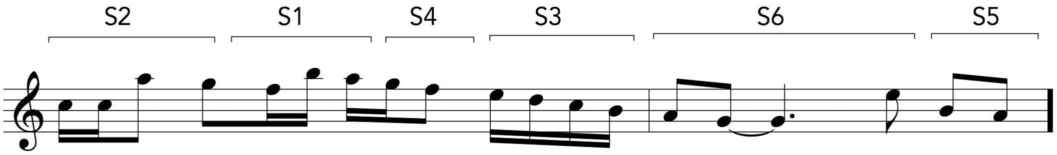


Figure 3.3. New melody with "scrambled" segments.

3) Apply the process to any of the following excerpts (Figures 3.4, 3.5, and 3.6) or choose one from Appendix C:

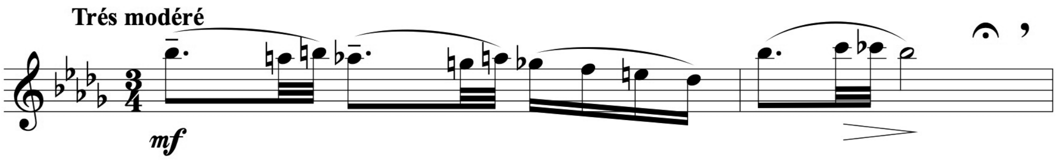


Figure 3.4. Claude Debussy, *Syrinx* (excerpt).

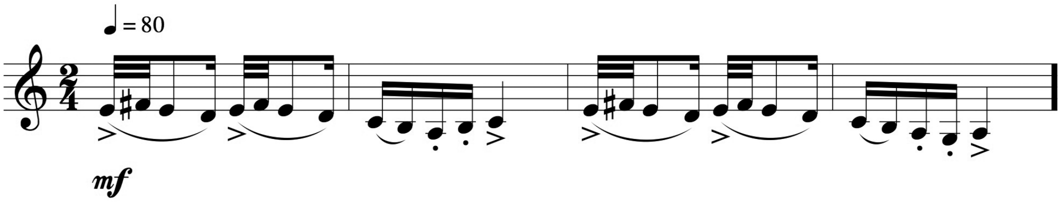


Figure 3.5. Béla Bartók, Piano Sonatina (excerpt).

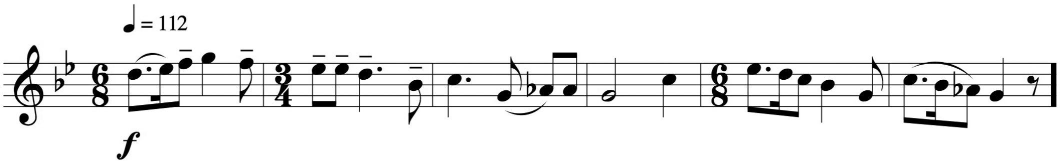


Figure 3.6. Ralph Vaughan Williams, *Fantasia on a Theme by Tallis* (excerpt).

43

Exercise 43: Using Segments per Measure

In this exercise you will **transform** the rhythmic structure of a melody using only two **segments** of equal length.

Guidelines:

a. Instrument: solo cello (check its register in Appendix D).
b. Duration: the length should be the same as the original melody (the explanation of the process will clarify this point).

Process:

a. On the given melody, create two segments (one per measure) (Figure 3.7).

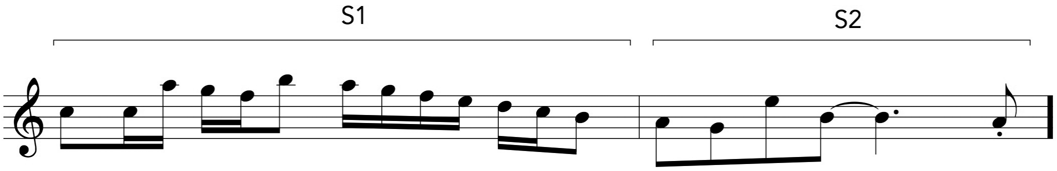
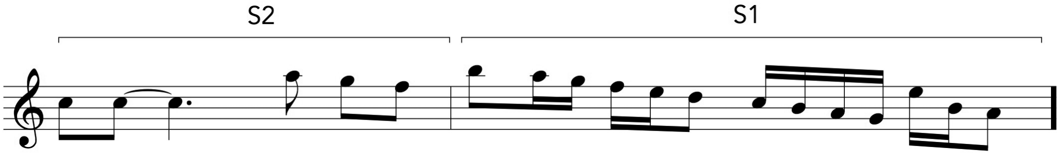


Figure 3.7. Given melody for exercise 43 with segments of equal length.

b. Without altering the order of the pitches in any way, invert the order of the segments, placing the *rhythm* of the second measure in the first one and vice versa (Figure 3.8).

Figure 3.8. Given melody with rhythmic segments inverted.

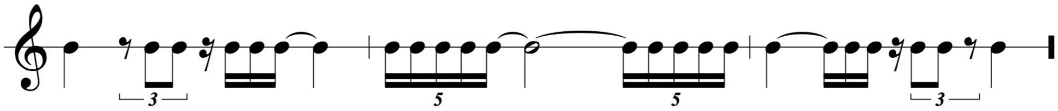


44

Exercise 44: Non-retrogradable Rhythms

In this exercise you will **create** non-retrogradable rhythmic structures or rhythmic palindromes (see example on Figure 3.9). The main property of these structures is that they are read (and performed) the same either forward or backward.

Figure 3.9. Non-retrogradable rhythmic structure.



Guidelines:

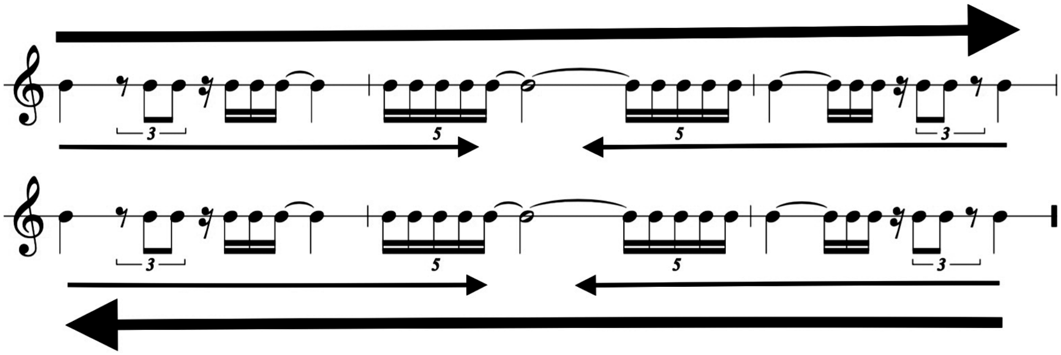
1) Instrument: snare drum.
2) Duration: between four and six measures.
3) Meter: 4/4.
4) Tempo: quarter note = 60.
5) Indicate in your score: dynamics, articulations, brushes/sticks/mallets, tempo, the use of the snare, and rolls if there are any.
6) All other parameters are free.

45

Exercise 45: Patterns within Patterns

In this exercise you will create non-retrogradable rhythmic structures that are built upon smaller non-retrogradable rhythms. A **palindrome made of palindromes** (see example on Figure 3.10).

Figure 3.10. Palindromes within palindromes.



Guidelines:

1) Instrument: snare drum.
2) Duration: between eight and ten measures.
3) Meter: 4/4.
4) Tempo: quarter note = 60.
5) Indicate in your score: dynamics, articulations, brushes/sticks/mallets, tempo, the use of the snare, and rolls if there are any.
6) All other parameters are free.

46

Exercise 46: Extracting the Rhythm of a Text

In this exercise you will extract the **rhythm of a given text** with respect to its syllables and accents.

Process:

1) Chose a text of any duration: e.g., *The helicopter is intimidating*.
2) Count its syllables and outline the accented ones:

   The helicopter **is** in**ti**midating.

3) Using the same rhythmic figure for all the syllables, translate the text to musical notation. In Figure 3.11 the chosen figure is the sixteenth note.

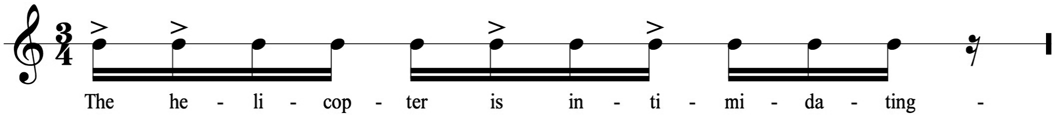

The he - li - cop - ter is in - ti - mi - da - ting -

Figure 3.11. Syllables in sixteenth notes.

4) Place the pattern in a loop to generate a larger section (Figure 3.12).

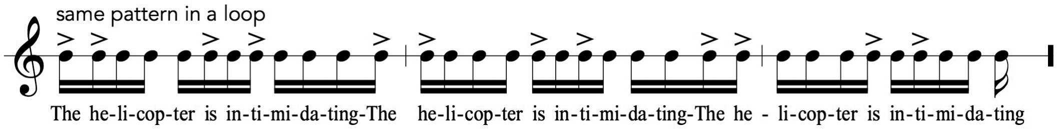

same pattern in a loop
The he-li-cop-ter is in-ti-mi-da-ting-The he-li-cop-ter is in-ti-mi-da-ting-The he - li-cop-ter is in-ti-mi-da-ting

Figure 3.12. Stream of sixteenth notes with the accents of the words.

Guidelines:

1) Tempo: quarter note = 100.
2) Instrumentation: snare drum.
3) Indicate in your score: dynamics, articulations, brushes/sticks/mallets, tempo, the use of the snare, and rolls if there are any.
4) All other parameters are free.

47

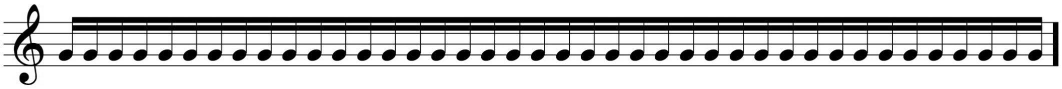
Exercise 47: Why Meter?

In this exercise you will explore a **rhythmic construction without a meter** and experiment with note **groupings** and **registral accents** (i.e., when a note gets an emphasis by virtue of a higher pitch). Listen and look at the score of movement VI, "Dance of fury, for the seven trumpets," from Olivier Messiaen's *Quartet for the End of Time*.

Process:

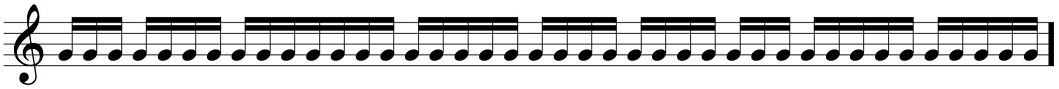
1) Create a stream of rhythmic figures of equal duration (eighths, sixteenths, thirty-seconds) (Figure 3.13). Do not use a meter.

Figure 3.13. Stream of sixteenth notes.



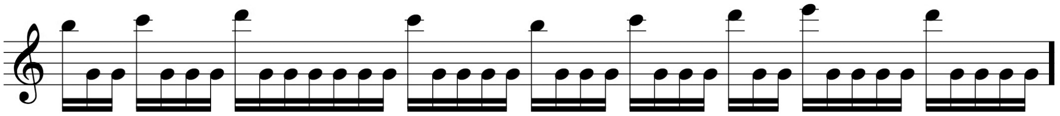
2) Split the continuous stream into smaller groups of three, four, five, or seven figures each (Figure 3.14).

Figure 3.14. Stream of sixteenth notes split into groups of 3, 4, 5, or 7.



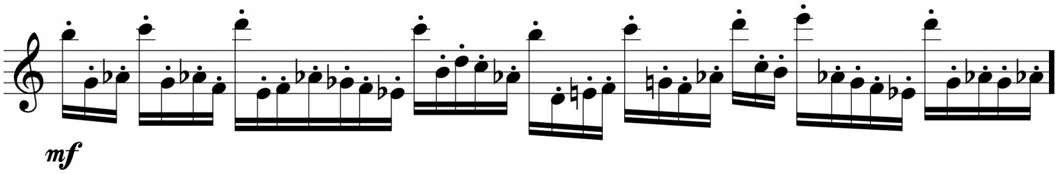
3) Assign a high pitch to the first figure of each of the small groups (Figure 3.15).

Figure 3.15. Incorporation of a *registral* accent.



4) Assign pitches to the other figures (Figure 3.16).

Figure 3.16. Registral accents + pitches + articulations.



Guidelines:

1) Tempo: eighth note = 100.
2) Instrumentation: solo oboe or English horn.
3) In your score indicate articulations, dynamics, tempo, and character. Mind the register and transposition of the instrument involved. Present your score transposed.
4) Do not use a time signature or barlines.
5) Duration: between 1' and approx. 1'15".
6) All other parameters are free.

48

Exercise 48: Short, Long, Long, Short—Using Morse Code

In this exercise you will extract the rhythm of a given text using a **Morse code translator**. The Morse code symbols will generate short (.) and long (-) rhythmic values and pauses (/).

Process:

1) Chose a text of any duration: e.g., *The helicopter is intimidating*.
2) Translate it using any Morse code translator available:

-...../......-.... -.-. ---.--. -..-./...../.. -. -.. --.. -...- -.. -. --.

3) Assign rhythmic values to each of the symbols. In this case the chosen figures are short (sixteenth note), long (eighth note) and pause (eighth-note rest). These choices are open and offer an open space for exploration (Figure 3.17).

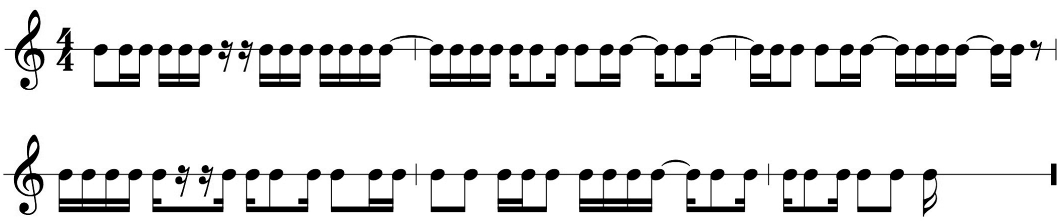


Figure 3.17. Morse code into rhythm.

Guidelines:

1) Tempo: quarter note = 100.
2) Instrumentation: snare drum. In your score indicate dynamics, articulations, brushes/sticks/mallets, tempo, the use of the snare, and rolls if there are any.
3) Durations should be assigned to the short, long, and pause symbols beforehand and should remain unchanged throughout the exercise.
4) All other parameters are free.

49

Exercise 49: Ostinato

In this exercise you will compose a melody starting from a **rhythmic ostinato**. A rhythmic ostinato is a repeating short rhythmic figure that reoccurs persistently. The snare drum part of Maurice Ravel's *Bolero* is an example of a rhythmic ostinato. In addition to that, some of Chopin's piano preludes are structured on simple and repetitive rhythmic patterns that help maintain the unity of the works. The excerpt from Prelude no. 20 in C minor (Figure 3.18) shows the one-measure rhythmic ostinato that reappears in the second measure and continues unaltered until the end of the work.

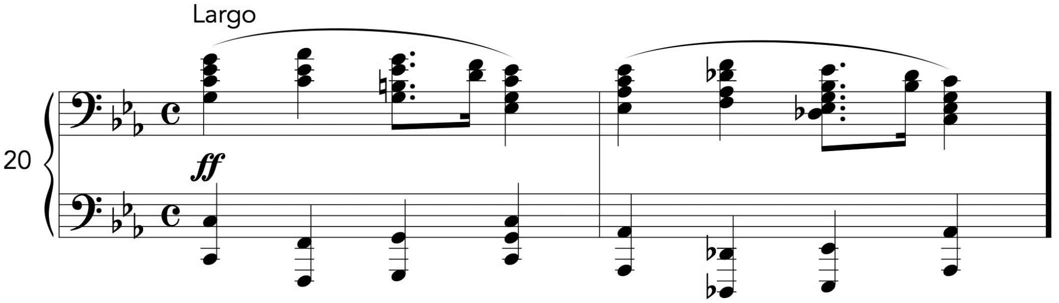


Figure 3.18. Frédéric Chopin, Prelude in C minor No. 20 (excerpt).

Process:

1) Write your own ostinato no longer than one measure long.
2) Repeat it between three and six times.
3) Assign pitches freely to it to create a melody after it.

Guidelines:

1) Instrumentation: solo flute.
2) Meter: 7/8 (make sure that your ostinato is written in the same meter).
3) Tempo: eighth note = 120.
4) Duration: three to six times the length of the ostinato.
5) In the score indicate articulations, dynamics, tempo, breath marks, and character.
6) All other parameters are free.

50

Exercise 50: Playing with Hemiolas

In this exercise you will explore the transformation of rhythmic structures using **hemiolas**. A hemiola is a musical rhythmic alteration in which six equal notes may be heard as two groups of three or three groups of two. A typical use of hemiolas can occur in a 3/4 time signature, where the quarter notes are alternatively grouped in groups of two or three. This effect can be achieved by means of dynamic accents (louder pitch) or tonal accents (higher pitch) challenging the perception of the meter.

Process:

1) Write a rhythmic structure that shows the time signature (Figure 3.19).

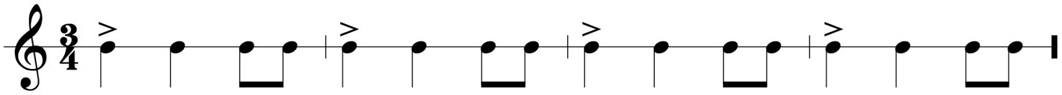


Figure 3.19. Rhythmic figure in a meter.

2) Apply accents to suggest a change of meter (Figure 3.20).

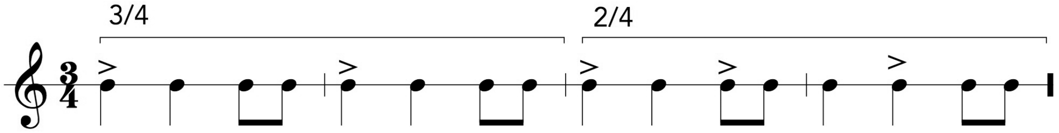


Figure 3.20. Use of accents to create a hemiola.

Guidelines:

1) Instrumentation: **snare drum**. Depending on the group, indicate in your score tempo, dynamics, articulations, mallets, and any other specific technique required.
2) Duration: 12–20 measures. Use at least one hemiola and no more than three.
3) Meter: you can choose the starting time signature freely, however, make sure that the hemiola is temporary; reinstate the original meter after it.
4) All other parameters are free.

51

Exercise 51: Hemiolas and Melodic Construction

In this exercise you will explore the transformation of rhythmic structures using **hemiolas** with registral accents. The temporary change of meter in this exercise will be achieved by means of *registral* accents (i.e., accents arising from a note in a higher register).

Process:

1) Write a rhythmic structure that shows the time signature (Figure 3.21).

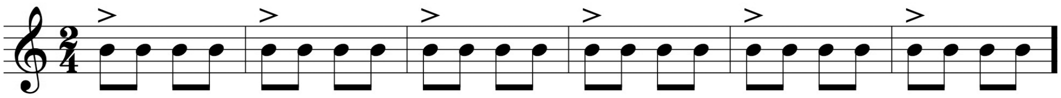


Figure 3.21. Rhythmic structure that *shows* the time signature.

2) Apply *registral* accents to suggest a temporary change of meter (Figure 3.22).

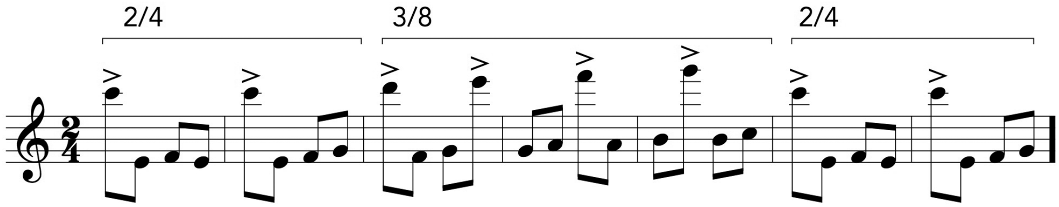


Figure 3.22. *Registral* accents to create a hemiola.

Guidelines:

1) Instrumentation: marimba.
2) Duration: 20 measures.
3) Meter: free. Make sure that the hemiola is temporary; reinstate the original meter after it.
4) Indicate in your score tempo, dynamics, articulations, and mallets.
5) All other parameters are free.

52

Exercise 52: Polymeter

In this exercise you will create a polyphonic texture in which the voices exist in a different meter. The concept of a polymeter (or **polymetric texture**) refers to the coexistence of several meters and the displacement of the "downbeat."

Process:

1) Write a rhythmic structure that shows the time signature (Figure 3.23).

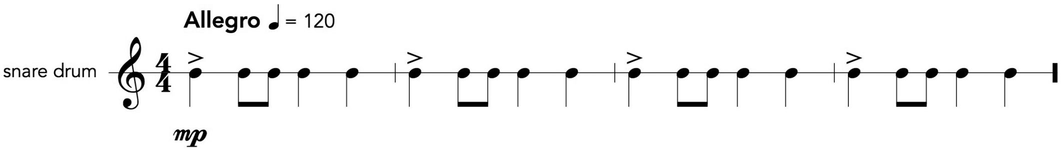
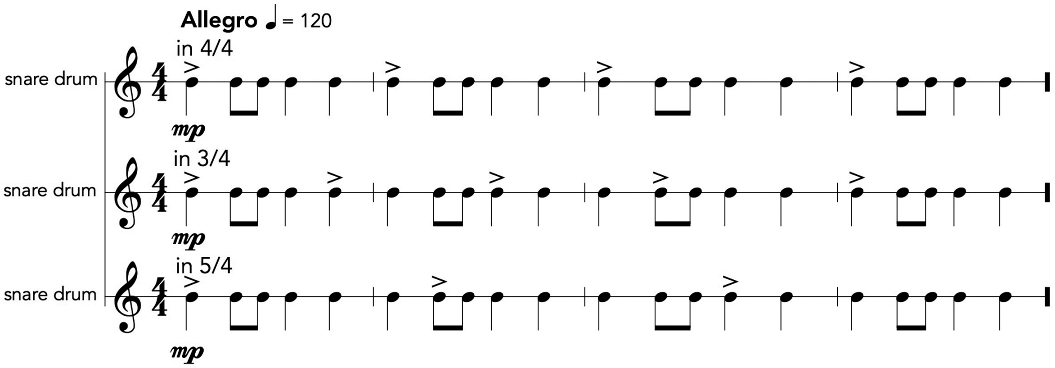


Figure 3.23. Rhythmic structure that *shows* the time signature.

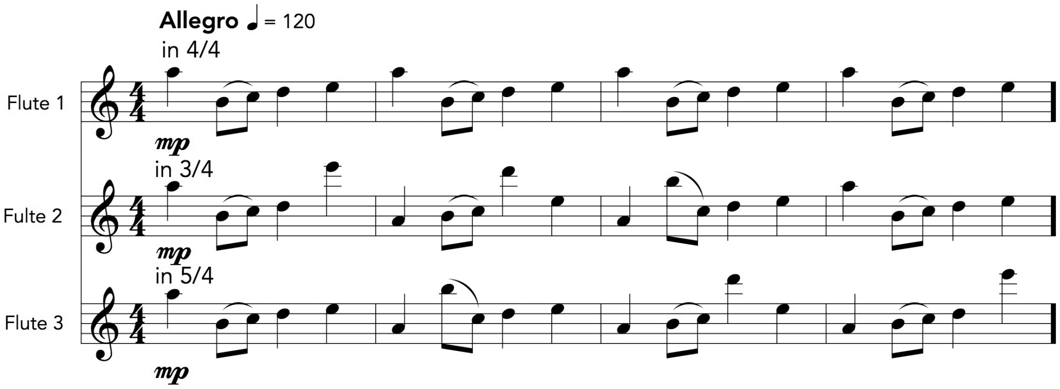
2) Add other voices and with the use of accents suggest an overlapping different meter (Figure 3.24).

Figure 3.24.
Polymeter with accents.



3) This result can also be achieved using registral accents (Figure 3.25).

Figure 3.25.
Polymeter with registral accents.



Guidelines:

1) Instrumentation: **flute trio or snare drum trio**. Depending on the group, indicate in your score tempo, dynamics, articulations, mallets, and breath marks.
2) Duration: four times the length of the rhythmic structure.
3) Meter: free. The options are endless, think 7/8, 3/4, and 4/4; 5/4, 4/4, and 8/8; 3/8, 5/8, and 11/8; and so on.
4) All other parameters are free.

53

Exercise 53: Metric Modulations

In this exercise you will create a **metric modulation**. A metric modulation is the shifting of the beat from one rhythmic value to another. Simple metric modulations might change the beat from a quarter note to a half note, or an eighth note to a sixteenth. American composer Elliott Carter pioneered these techniques as a precise tool in order to exact tempo switching. Instead of ambiguous indications such as "Slightly faster," "Tempo primo," "accelerando," and so on, a metric modulation allows those changes within the realm of exact mathematical proportions (Figure 3.26).

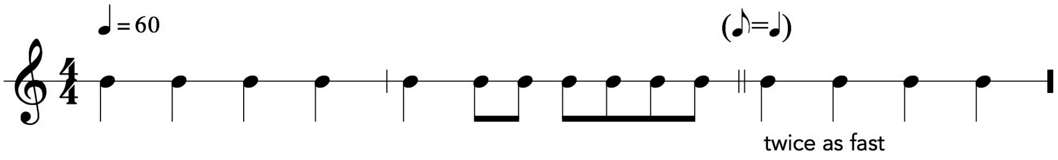
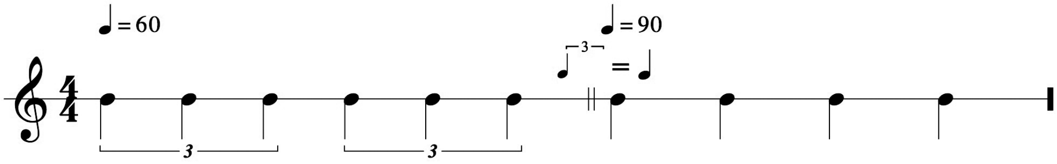


Figure 3.26. Example of simple metric modulation.



in the original tempo the half note = 30 (60 / 2),
therefore the quarter note triplet = 90 (30 * 3).

Figure 3.27. Example of metric modulation using triplets.

Guidelines:

1) Instrumentation: snare drum or vibraphone. Indicate in your score the original tempo, the modulation (i.e., quarter note = eight note), and the new tempo after the modulation. The latter is not usually notated in the score, but it will help understand the process and handle the simple math calculation properly (Figure 3.27).
2) Include indications of dynamics, articulations, and mallets.
3) Duration: **write three different modulations.** Each of the modulations should be between three to four measures long. Indicate the transition with a double bar (see Figures 3.26 and 3.27).
4) All other parameters are free.

54

Exercise 54: Using Rhythmic Motifs

In this exercise you will create and employ **rhythmic motifs** as building blocks. A rhythmic motif is a short distinctive rhythmic idea.

Process:

1) In a meter of your choice, create a series of six one-measure-long rhythmic motifs (Figure 3.28).

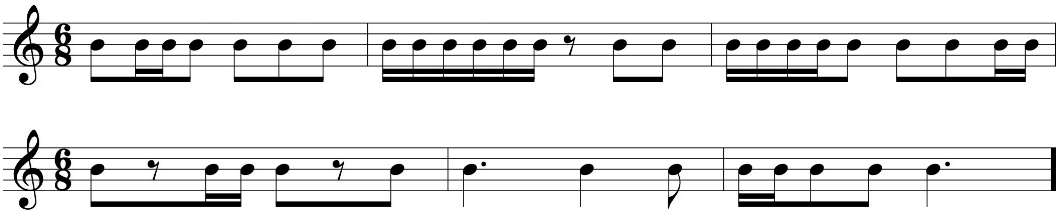
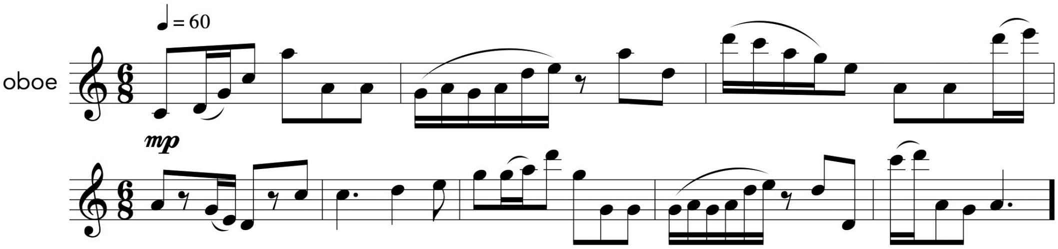


Figure 3.28. Series of six one-measure-long rhythmic motifs.

2) Using different combinations of the motifs, create a melodic line using a pentatonic scale of your choice. In the broad sense, a pentatonic scale is a collection of five different pitches. However, two of the more typical pentatonic scales are C–D–E–G–A and C–E♭–F–G–B♭ (they can be transposed freely) (Figure 3.29).

54

Figure 3.29. Rhythmic motifs embedded in a melody.



Guidelines:

1) Instrumentation: oboe or flute.
2) Duration: 18 measures (three complete iterations of the set of motifs).
3) Meter: keep the meter used for the motifs.
4) Pitch content: a pentatonic collection of your choice.
5) In your score indicate tempo, articulations, breath marks, and dynamics.
6) All other parameters are free.

55

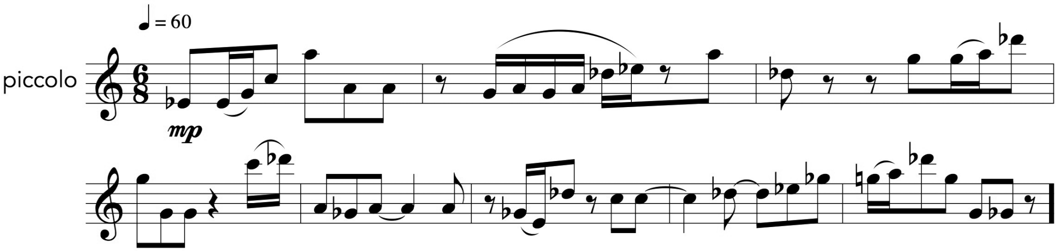
Exercise 55: Motivic Displacement

In this exercise you will practice **motivic displacement**. The motifs created and used in exercise 54 started and ended within the measure. In this exercise the motifs will appear shifted in time.

Process:

1) In a meter of your choice, create a series of six one-measure-long rhythmic motifs (refer to Figure 3.28).
2) Using different combinations of the motifs, and **shifting them in time**, create a melodic line using the given octatonic scale (Figure 3.30). An octatonic scale is comprised of eight different pitches composed of alternating whole and half steps. In the exercise use the following one: A–B♭–C–D♭–E♭–E–F♯–G.

Figure 3.30. Rhythmic motifs + octatonic scale.



Guidelines:

1) Instrumentation: bassoon or piccolo.
2) Duration: 18 measures.
3) Meter: keep the meter used for the motifs.
4) Pitch content: given octatonic scale.
5) In your score indicate tempo, articulations, breath marks, and dynamics.
6) All other parameters are free.

56

Exercise 56: Isorhythmic Motets, *Talea* and *Color*

Isorhythm is a technique that uses a recurring rhythmic pattern (*talea*). Composers of the thirteenth century such as Gillaume de Machaut and Phillipe de Vitry also combined the *talea* with *color*, which is an ordered set of pitches. In the twentieth century, Olivier Messiaen incorporated this technique into his *Quartet for the End of Time* and other works. It is important to mention that *talea* and *color* have different numbers of components, thus generating interesting displacements when repeated (see Figure 3.31).

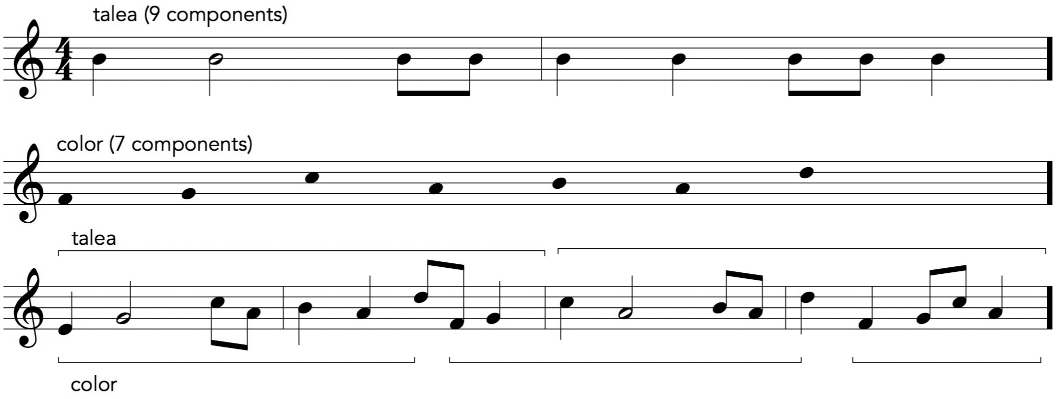


Figure 3.31.
Talea and *color.*

Process:

1) Create a *talea*.
2) Create a *color* with a different number of components. The pitch content here is free, any scale or collection of pitches can be utilized. If you decide to use a 12-tone row make sure that your *talea* does not have 12 components.
3) Combine them.

Guidelines:

1) Instrumentation: bass trombone or tuba.
2) Duration: six iterations of the *talea*.
3) Indicate in your score: dynamics, tempo, articulations, mute, and character.
4) All other components are free.

57

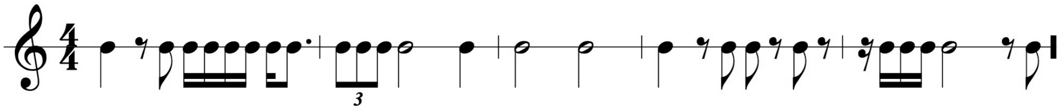
Exercise 57: Repeat Signs, Loops, and Internal Spiraling

This exercise focalizes on the use of **repeat signs** ||::|| as tools for phrasing and rhythmic variation. Paradoxically, the placement of the repeat signs and the number of repeats can be tools to enhance variation and "internal spiraling" of the musical discourse of a piece.

Process:

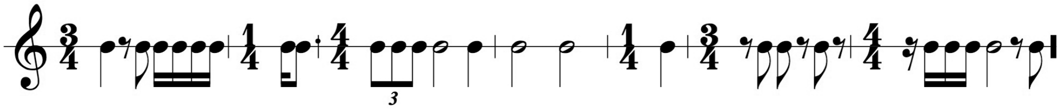
1) Create a simple rhythmic structure in a meter of your choice (Figure 3.32).

Figure 3.32. Simple rhythmic structure.



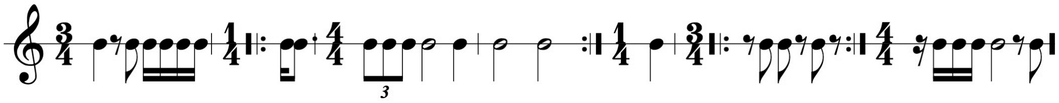
2) Rebar it in order to facilitate the internal "spiraling" without changing its aural result (Figure 3.33).

Figure 3.33. Simple rhythmic structure rebarred.



3) Add repeats in order to create an irregular spiraling within the original rhythmic structure (Figure 3.34).

Figure 3.34. Use of repeat signs.



Guidelines:

1) Duration: 12 measures. Remember that when you rebar the original structure, its purpose is only to have an anchor point for where to "go back" with the repeat sign.
2) Meter: 4/4. The use of the repeats should suggest other meters when repeating.
3) Use at least two repeat signs to create internal spiraling.
4) Instrumentation: solo trumpet.
5) Indicate in your score: articulations, dynamics, mutes, tempo, and breath marks.
6) All other parameters are free.

58

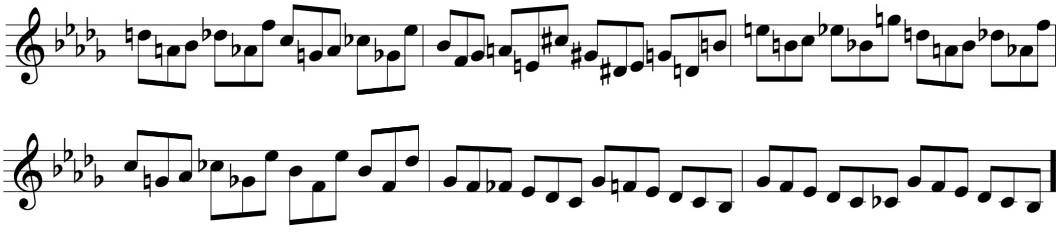
Exercise 58: Composing with Unequal Rests and Pauses

In this exercise you will explore with the implementation of **fermatas** and **grand pauses** of unequal duration. Unlike the process of elimination (in which you substitute a rhythmic figure by its corresponding rest), the *fermatas* of unequal duration can add a new layer to the musical discourse.

Process:

1) Choose a musical excerpt. Here you can use any of the examples provided in Appendix C, bring back some of the solutions that you wrote from previous exercises or create a new one. This example will focus on an excerpt of the right hand of the last movement of Frédéric Chopin's Piano Sonata in B flat minor (Figure 3.35).

Figure 3.35. Frédéric Chopin, Sonata in B flat minor (excerpt of last movement).



2) Choose the placement of the pauses (Figure 3.36).

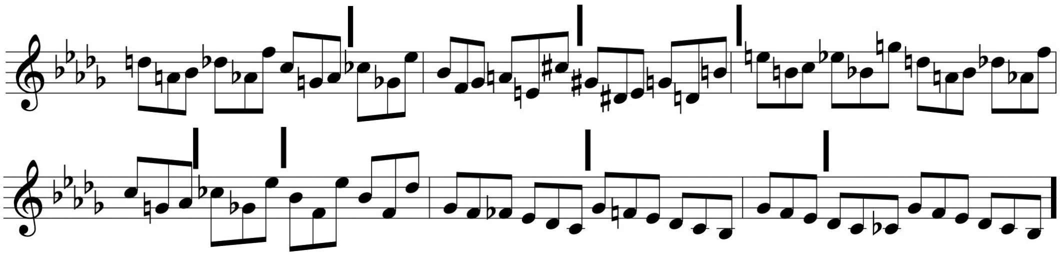


Figure 3.36. Placement of pauses in the excerpt.

3) Create the pauses and assign the fermatas of unequal durations using a precise timecode (i.e., 15'', 2'', 1', etc.). The tempo marking indication becomes vital for the balance between pauses and non-pauses (see a possible solution on Figure 3.37).

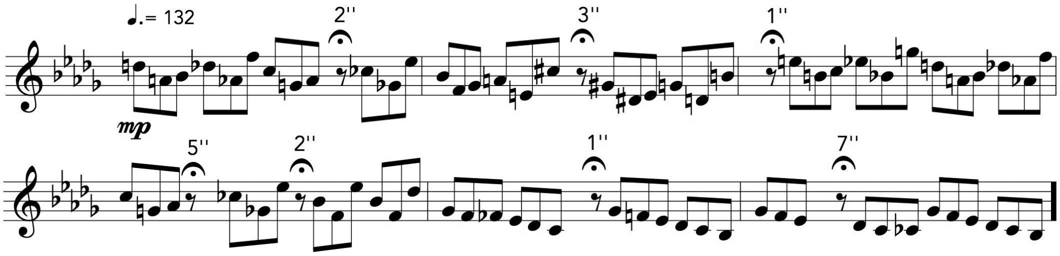


Figure 3.37. Pauses with specific durations.

Guidelines:

1) Instrumentation: single instrument of your choice.
2) Duration: between 45'' and approx. 1'.
3) Use at least five pauses of unequal duration.
4) In your score indicate tempo marking, character, articulations, dynamics, and other specific instructions for the instrument of choice (i.e., type of mute, breath marks, bowings, etc.).
5) Meter: keep the meter of the original excerpt unless you are composing a new fragment for this exercise.
6) All other parameters are free.

59

Exercise 59: Eliminations, Everything Coming from the Same Tune

In this exercise you will explore the process of **elimination** both in the melodic and rhythmic domains. Can you compose a new work *exclusively* using material coming from an already composed one?

Process:

1) Choose an excerpt or a complete piece. The example in Figure 3.38 uses an excerpt from Charlie Parker's solo on his tune *Confirmation*.

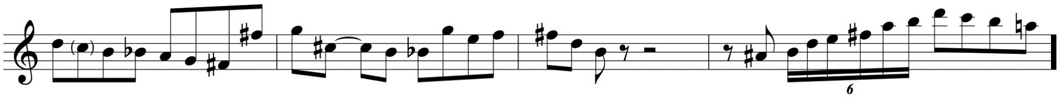
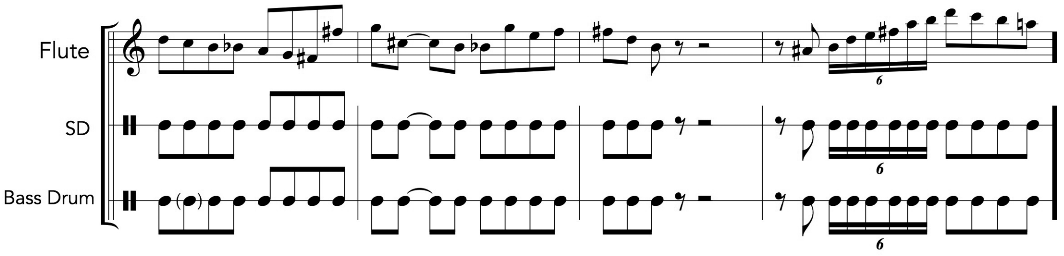


Figure 3.38. Charlie Parker solo on *Confirmation* (excerpt).

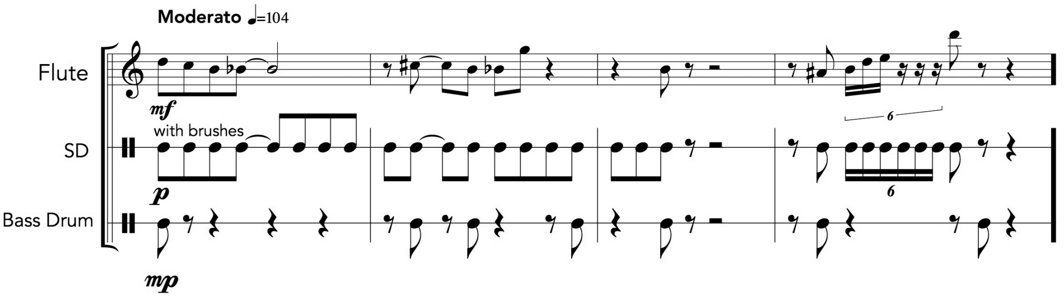
2) Place it in three different staves (flute, snare drum, bass drum) (Figure 3.39).

Figure 3.39.
Excerpt in three staves.



3) Using the process of elimination (as explained in exercise 20), transform the melodic line and the rhythm of the snare drum and the bass drum (Figure 3.40).

Figure 3.40.
Transformed excerpt using *eliminations*.



Guidelines:

1) Instrumentation: flute, snare drum, and bass drum. Indicate in your score tempo, dynamics, articulations, and mallets.
2) Duration: twice the length of the melody excerpt. Transform the excerpt in a different way the second time (using elimination techniques).
3) Meter: use the same meter as the excerpt of the melody that you choose to transform.
4) Choose one of the melody excerpts contained in Appendix C.
5) Tempo and all other parameters are free.

60

Exercise 60: Perceivable and Non-perceivable Pulse

In this exercise you will experiment with **pulse**. At the perceptual level, pulse in music could be defined as isochronous events (i.e., that occur periodically, with the same time intervals). From the compositional standpoint, pulse can be shown (made perceivable) or hidden (made imperceptible). It is important to remember that meter (time signature) and pulse, even though usually related, are not necessarily tied to each other. The perceived pulse can contradict the meter (time signature) and a pulse can be perceived in a composition without a meter.

Process (how to incorporate the perception / non-perception of pulse):

1) Choose a rhythmic excerpt that shows the pulse. In Figure 3.41, the rhythmic events occur mostly on the strong part of the beats, therefore the perceived pulse will be the quarter note.

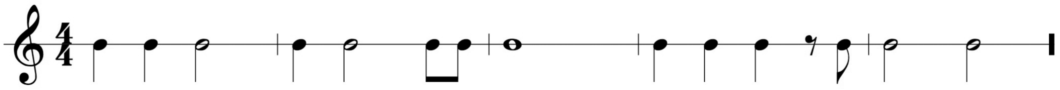


Figure 3.41. Rhythmic structure with perceivable pulse.

2) Choose a place to insert a section where the pulse will become non-perceivable (Figure 3.42).

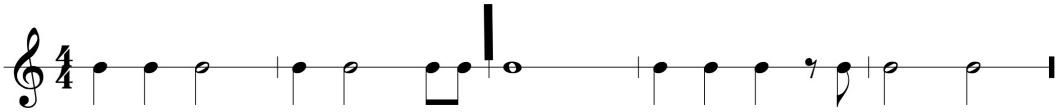


Figure 3.42. Placement of a section with non-perceivable pulse.

3) Insert two or three measures where the rhythmic events do not occur on the strong part of the beats. Look also for certain degree of "rhythmic irregularity" that can help obliterate the perception of isochronous events (Figure 3.43).

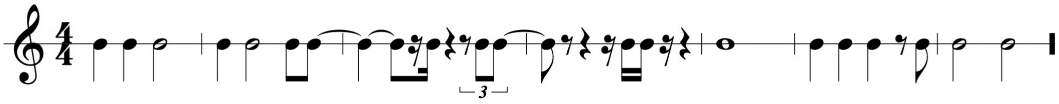


Figure 3.43. Rhythmic structure with sections of perceivable and non-perceivable pulse.

Guidelines:

1) Meter: use the same meter of the rhythmic excerpt that you choose.
2) Instrumentation: solo B♭ clarinet or bass clarinet.
3) Form: the overall structure of the exercise should have three sections. It should start with a section A (where the pulse is perceivable), continue with a section B (where the pulse is non-perceivable), and end with a section C where the pulse becomes again perceivable. The duration of each section is free.
4) Tempo: free. However, it is important that for this exercise the tempo marking remains unchanged. Refrain from using *accelerando* or *ritardando*.
5) Indicate in your score dynamics, articulations, and breath marks. Present your score transposed; be mindful of the register and transposition interval for the chosen instrument.
6) Duration: between four and six iterations of the rhythmic pattern.
7) Pitch content: use exclusively pitches from the scale in Figure 3.44 in any order and register.

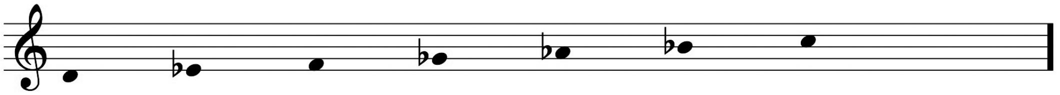


Figure 3.44. Given scale for exercise 60.

8) All other parameters are free (Figure 3.45).

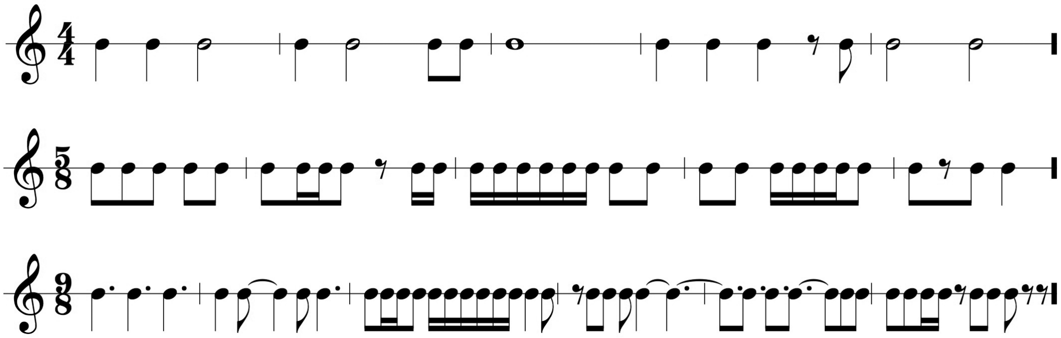


Figure 3.45. Rhythmic excerpts for exercise 60.

4

Texture (Exercises 61–80)

Preliminary Notes

Texture in this chapter represents—in the broadest sense—the interaction between all musical parameters that make a composition.

There are different types of textures. Those types can be classified according to the number of voices involved, the way in which those voices interact, the hierarchy between the components of the texture, the role of the melody, and so on. The texture can change within the same composition; moreover, the texture of a composition can be the result of the addition of a number of different textural approaches that also change! The following non-exhaustive list presents some of the most used definitions of the different types of musical textures. These concepts can be of help while tackling the exercises contained in this chapter.

Monophonic: the single line, the texture consists of only one voice. There are special situations in which the single line is composed to create the *illusion* of multiple lines; that is the case of a *compound* melody (see Chapter 1). In a compound melody the texture is monophonic while polyphony is *implied*.

Polyphonic: the texture consists of multiple independent voices with independent rhythm. The term *biphonic* is sometimes used to refer to compositions that involve only two independent voices (e.g., Bach two-part inventions from the *Well-Tempered Clavier*).

Homorhythmic: the texture consists of multiple voices that move with the same rhythm, in strict synchronicity.

Homophonic: a term associated with "melody with accompaniment," where the melodic line has a prominent role in the texture.

Heterophonic: this term refers to a texture in which all its components are transformations (or variations) of the same thematic material.

Textural stratification: this type is present in a composition where the texture is the result of overlapping autonomous elements. This type does not refer to overlapping variations on the same thematic source but to independent, dissimilar material presented at the same time. Examples of textural stratification can be found in the second movement of *Three Places in New England* by Charles Ives.

Micropolyphony: this term is associated with works by György Ligeti (e.g., *Lux aeterna*, *Atmosphères)*, in which the composer uses multiple independent lines

Composing with Constraints. Jorge Variego, Oxford University Press. © Oxford University Press 2021. DOI: 10.1093/oso/9780190057237.003.0005

to generate tone clusters of great internal activity. Those clusters emerge out of the high density of the polyphonic action within a limited range. This type of texture can be seen as tone clusters generated by multiple moving lines that overlap.

Sound masses: multiple sound events or sources are heard as a single meaningful unit. In the sound masses, the individuality of the single line is obliterated and a global gestalt emerges. Some of the guiding principles in this type of texture are density, color, shape, and gesture.

The exercises contained in this chapter provide guidelines for exploring different types of textures through analysis and experiments in stylistic imitation.

Exercise 61 proposes the use of analysis and stylistic imitation; 62 is based on voices that move at the same rhythm. Numbers 63 and 64 are intended to work on melodic motifs and polyphony. Phasing is incorporated in 65; 66 talks about plaining à la Debussy. The goal of 67 is to dissect a complex texture to generate individual lines; 68 uses the concept of a rhythmic ostinato as a unifying factor. Numbers 69 and 70 incorporate aleatory concepts. Micropolyphony is the base of 71. A free approach to Fux and species counterpoint is the core of 72 and 73; 74 and 75 deal with timbral modulations and changes of orchestrational color; 76 is also about orchestration, but it specifically tackles orchestrational volume. Exercise 77 uses text painting and the translation of the written word into sound. In 78 students will experiment with heterophonic textures and in 79 with layered (or stratified) textures. The final exercise 80 deals with sound masses.

Exercises

61

Exercise 61: Analyzing Chopin

In this exercise you will **extract the texture** (i.e., how the different layers of a piece interconnect) from an excerpt of the Prelude No 13 in F♯ by Frédéric Chopin and apply it using a series of given harmonic progressions (other excerpts for analysis can be found in Appendix C).

Guidelines:

1) **Analyze thoroughly** the excerpt in Figure 4.1 and **make an exhaustive list of its features** considering the following:
   a. How many harmonies per measure does Chopin use?
   b. What are those harmonies? How are they presented?
   c. What does the right hand do? What is its rhythmic structure? Which pitches does it use?
   d. What does the left hand do? What is its rhythmic structure and how does it relate to the rhythm of the right hand? Which pitches does it use? Are those arpeggios?
   e. How does the bass line move?

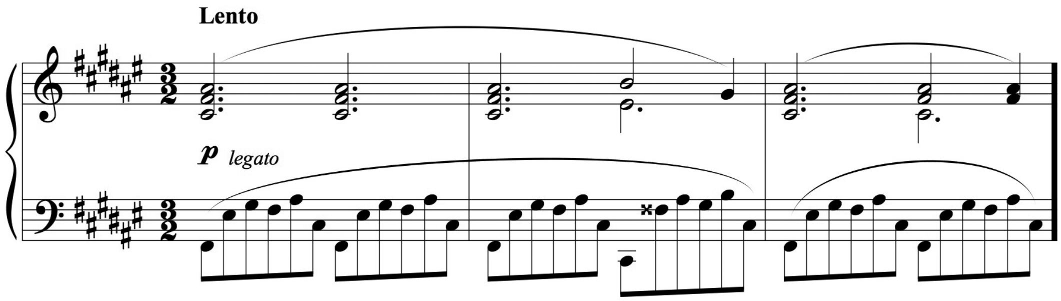


Figure 4.1. Frédéric Chopin, Prelude No. 13 in F sharp (excerpt).

2) **Using the list that you created**, compose a short excerpt for solo piano that embeds **ALL** the characteristics that you extracted **AND**:
   a. Length: four to five measures long.
   b. Meter: free.
   c. Use one of the following harmonic progressions:
      i. C7 Dm G7 A♭ A♭7
      ii. E♭ Cm A♭ Fm B♭7
      iii. A E/G♯ F♯m C♯m/E D A/C♯
      iv. E D/E A/E C♯m/E F♯m/E
      v. C E A♭ C E A♭
      vi. C G C G C G

62

Exercise 62: Homorhythmic

In this exercise you will compose a **homorhythmic** texture (i.e., all voices have the same rhythm) based on a given melody.

Guidelines:

1) Instrument: piano.
2) The given melody should appear in the highest voice of the right hand.
3) For the lower voices:
   a. Build the chords using a *single interval* of your choice (i.e., if you choose major seconds, your harmonies should *only* have major seconds).
   b. Use two to four voices in addition to the given melody. Mind the playability of your piece; have in mind that most pianists cannot reach more than a ninth!
   c. The additional voices should have the same rhythm as the given melody, all voices should move in block chords.

Process:

Step 1 (Figure 4.2).

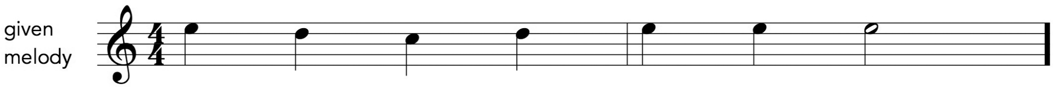
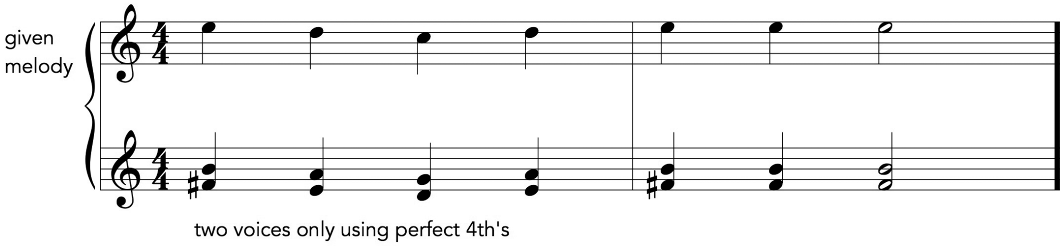


Figure 4.2. Given melody for exercise 62.

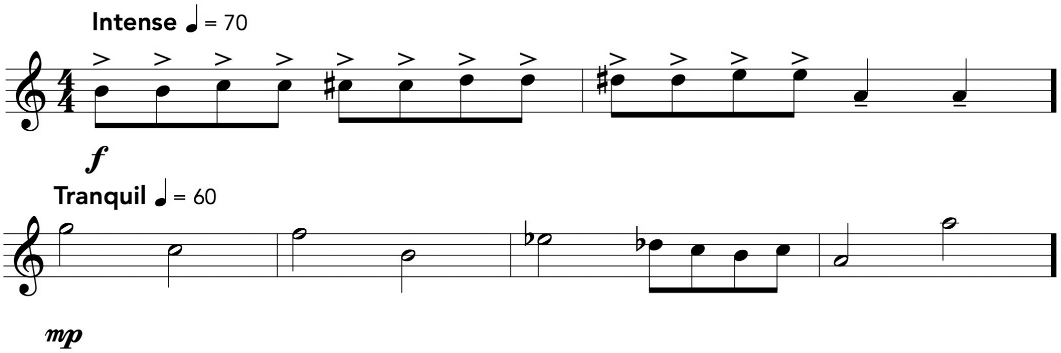
Step 2 (Figure 4.3).

Figure 4.3.
Possible solution.



For this exercise you can use the given melody of the example, any of those in Figure 4.4, or choose one from Appendix C.

Figure 4.4.
Additional melodies.



63

Exercise 63: Melodic Motifs

In this exercise you will compose a **polyphonic** texture (i.e., all voices are independent) for two violins and viola based on a series of **melodic motifs** that intertwine freely.

Process:

1) Write your own two melodic motifs and choose two from the ones given in Figure 1.25.
2) Compose a two violin and viola trio that combines ALL four motifs in three possible ways:
   a. The last pitch of a motif is the first one of the next one (in this situation you will have to transpose carefully).
   b. All motifs appear non-transposed, with their original pitches.
   c. A combination of the two previous processes, where sometimes the motifs appear transposed and sometimes with their original pitches.
3) **Compose each line independently** using exclusively the material coming from the given melodic motifs. Do not consider the vertical result when composing; focus on each of the lines independently.

Guidelines:

1) Duration: six to eight measures.
2) Meter: 4/4.
3) Tempo: quarter note = 72.
4) In your score include articulations, bowings, dynamics, and tempo.
5) All other parameters are free.

64

Exercise 64: All the Same but Different

In this exercise you will compose a **polyphonic** texture for woodwind quartet (flute, oboe, clarinet, and bassoon) based on a series of rhythmic transformations on the same motif.

Process:

1) Choose or create a simple motif (Figure 4.5).

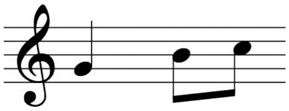


Figure 4.5. Simple motif.

2) Transform its rhythm, multiplying each of its figures by the same integer (e.g., × 2, × 4, × 8) (Figure 4.6).

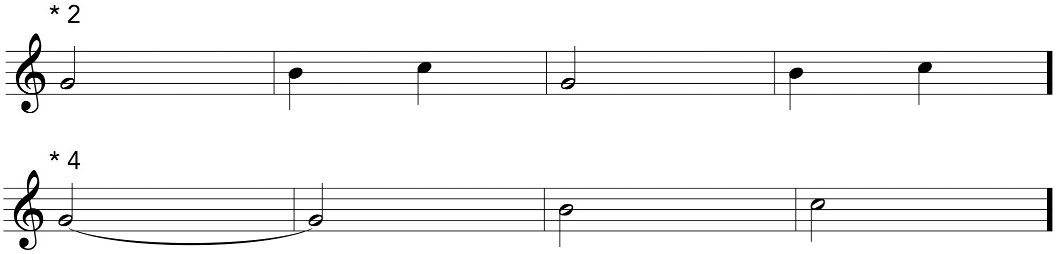


Figure 4.6. Motif transformed by multiplication.

3) Assign each of the rhythmically transformed lines to each of the different instruments (Figure 4.7).

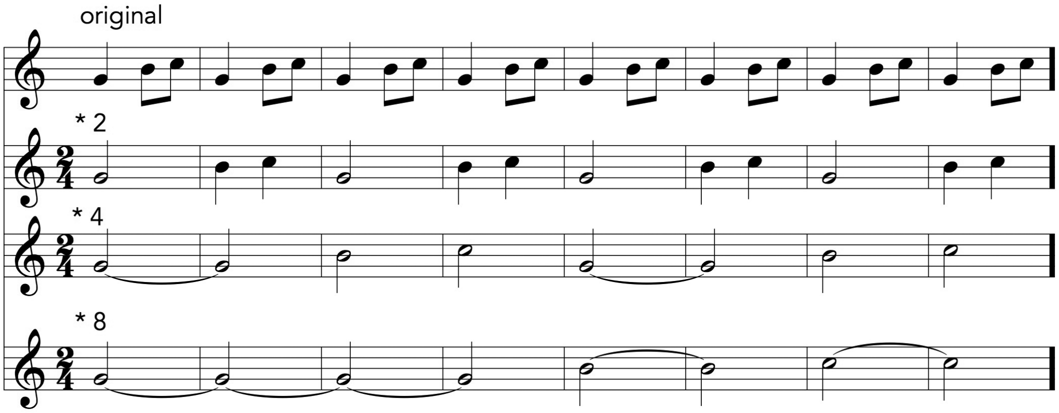


Figure 4.7. Motif transformations assigned to layers.

Guidelines:

1) Duration: 12–14 measures.
2) Instrumentation: woodwind quartet (flute, oboe, clarinet, and bassoon). Mind their registers and transpositions. Present your score transposed.
3) Meter: 2/4.
4) Tempo: quarter note = 72.
5) For this exercise **create your own simple motif**.

65

Exercise 65: Phasing

In this exercise you will compose a texture based on the idea of **phasing.** Phasing is a compositional technique in which the same part is played on two instruments, in steady tempo with some degree of temporal displacement.[1]

Guidelines:

1) Duration: 25–35 measures.
2) Instrumentation: solo piano or keyboard.
3) The exercise should start and finish with no temporal displacement between the two instruments.
4) For this exercise you will **compose the repeating motif** or short phrase that is displaced in time.
5) Meter: 2/4.
6) Tempo: quarter note = 120 (mechanical, steady).
7) Indicate on the score the amount of time displacement that you are employing.
8) All other parameters are free.

Figure 4.8 shows one possible solution.

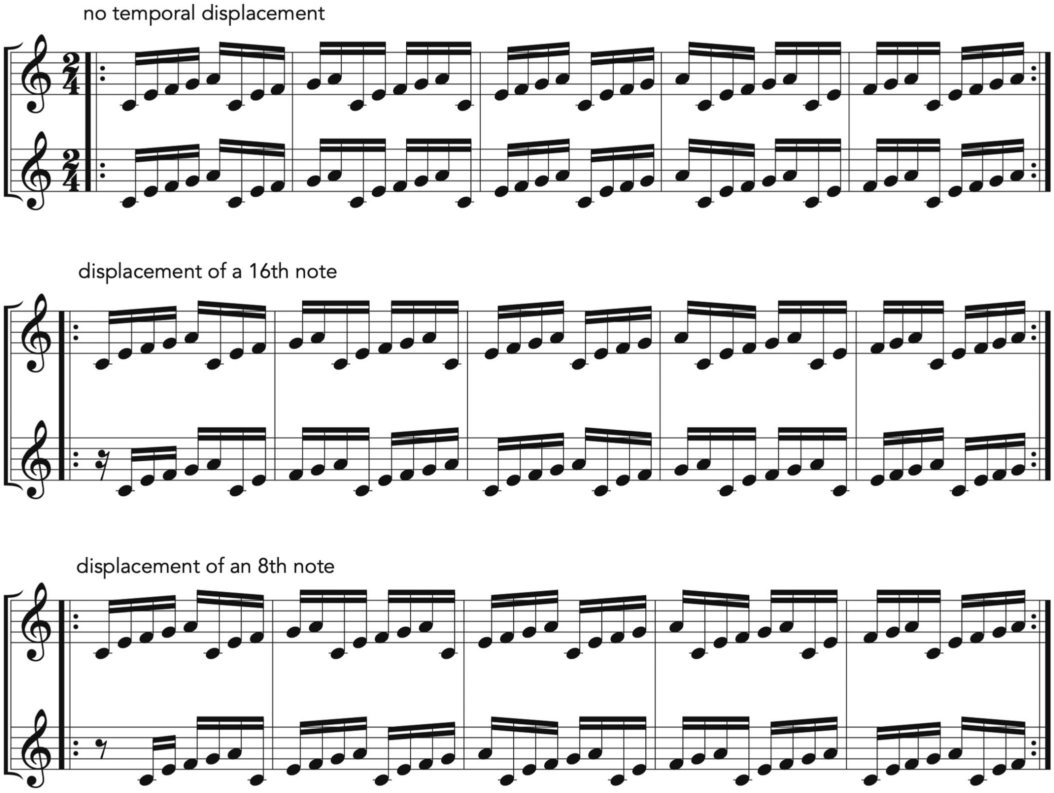


Figure 4.8. Phasing possible solution.

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[1] In the realm of audio recording, phasing is the result of the combination of two identical signals in the time domain.

66

Exercise 66: Analyzing Debussy, Plaining

In this exercise you will **extract** the texture (i.e., how the different layers of a piece interconnect) from an excerpt of the *The Sunken Cathedral* by Claude Debussy and apply it using a series of given harmonic progressions (other excerpts for analysis can be found in Appendix C).

This exercise focuses on a specific technique (known as ***plaining)*** where some familiar chord structures are treated freely, being removed from their tendencies and four-part voice leading rules. Here, in m. 62–63 of *The Sunken Cathedral,* we can appreciate how Debussy employs a purely parallel motion of dominant seventh structures, celebrating their *sonority* and not their harmonic function within a progression. D♯7, C♯7, B7, and A7 are presented as *sonorities* that move in parallel following a whole tone scale root motion (see Figure 4.9).

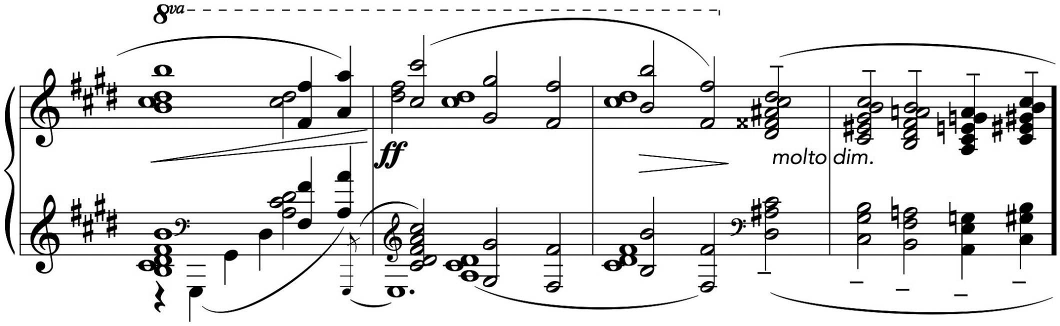


Figure 4.9. Claude Debussy, *The Sunken Cathedral* (excerpt).

Guidelines:

1) Duration: 12–14 measures.
2) Instrumentation: solo piano or keyboard percussion.
3) Use only ONE familiar sonority that moves in parallel throughout the exercise. That sonority could be: major triad, minor triad, major triad with minor seventh, major triad with major seventh, or minor triad with major seventh.
4) The chords MUST move in parallel following a sequence, scale, or pattern of your choice (e.g., the familiar sonority can be a minor triad that moves in parallel seconds). The chords can also move in parallel but freely (without a sequence).
5) Use four voices.
6) In your score indicate: tempo, character, dynamics, articulations, meter, and pedal markings.
7) Tempo: quarter note = 60–80.
8) Use at least 20 events (sonorities that move in parallel).
9) All other parameters are free.

67

Exercise 67: Liszt, Simple Harmonies, Complex Texture

In this exercise you will **extract the texture** (i.e., how the different layers of a piece interconnect) from Franz Liszt's Etude No. 5 (from his *Etudes in 12 Exercises* for solo piano). This etude shows a complex multi-layered texture based on plain diatonic harmonies. In

B♭ major, the progression moves in the following way: F7/E♭ B♭/D, Ao, B♭, B♭/F, F7, F7/A B♭, F7/E♭, B♭/D, Ao. Expressed as Roman numerals (without the inversions): V7, I, viio, I, V7, B♭, V7, I (Figure 4.10).

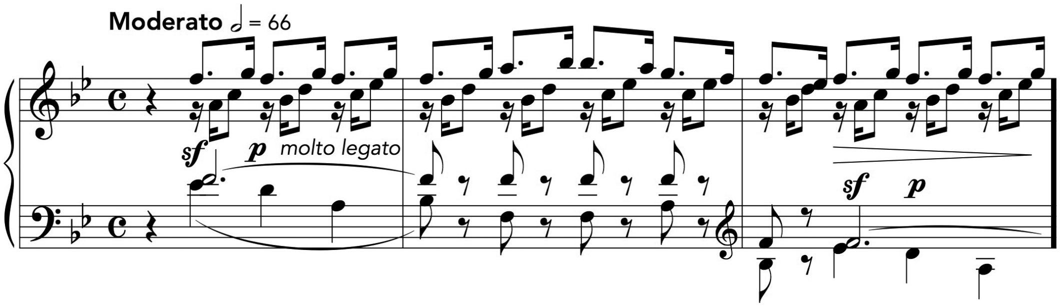


Figure 4.10.
Franz Liszt, Etude No. 5, from his *Etudes in 12 Exercises* for solo piano (excerpt).

The four individual parts of this texture intertwine and could be dissected into the components in Figure 4.11.

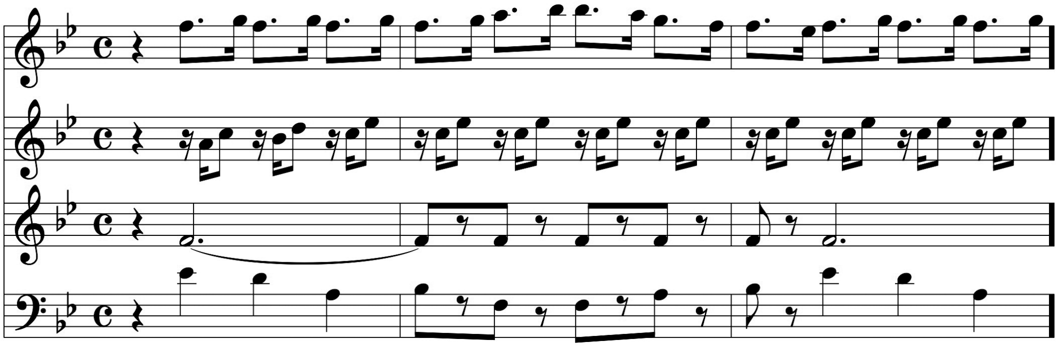


Figure 4.11.
Liszt's excerpt dissected.

Process:

1) Create a simple harmonic progression (e.g., C, Em, Am, Dm, G).
2) Using one of the piano excerpts contained in Appendix C (or one of your own) as model, compose a short excerpt for solo piano that utilizes the progression that you created (Figure 4.12).

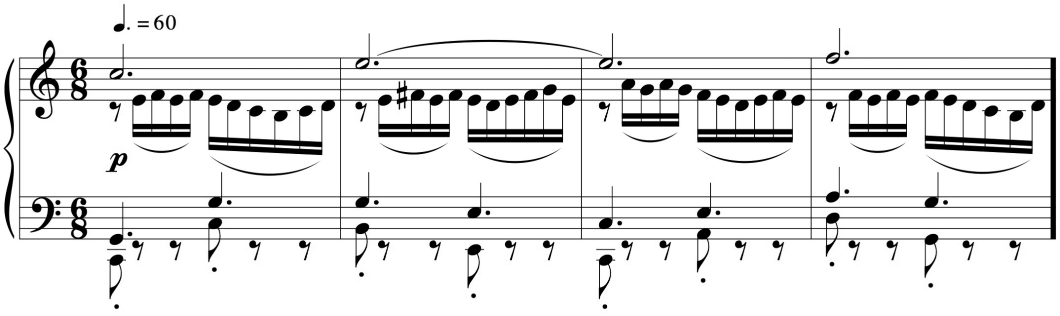


Figure 4.12.
Original piano excerpt based on the given harmonic progression.

3) Assign the components of the piano texture to the chosen instrumentation. This step can involve small changes in note duration and articulation (Figure 4.13).

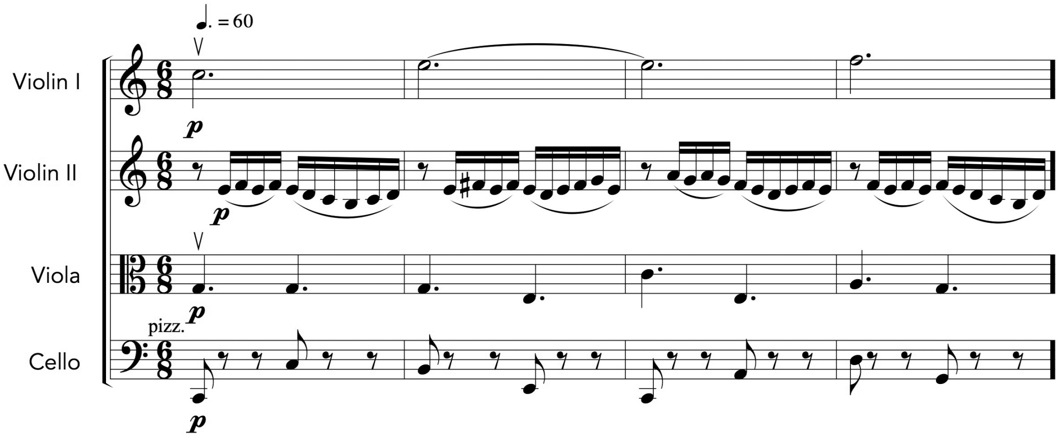


Figure 4.13. Instrumentation of the textural components.

Guidelines:

1) Instrumentation: string quartet.
2) In your score indicate dynamics, tempo, articulations, bowings, and other specific techniques for the string instruments. In addition to the finalized quartet score, include the piano part that you composed for the intermediate step of the compositional process.
3) Duration: 12–16 measures.
4) Meter: 7/8 or 12/8.
5) All other parameters are free.

68

Exercise 68: Ostinatos

In this exercise you will compose a short excerpt with a texture based on a **repetitive rhythmic figure**. The model for this exercise is the Prelude for piano No. 7 in A by Frédéric Chopin. Here the composer based his work on a rhythmic *ostinato* of six beats that stays present in the right hand throughout the piece (Figure 4.14).

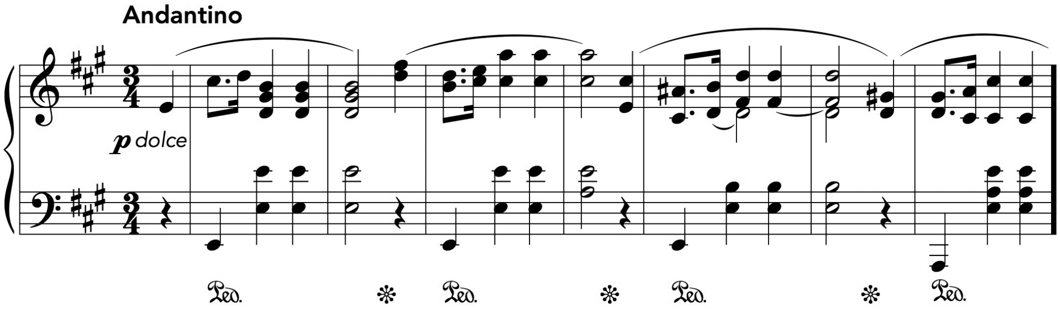


Figure 4.14. Frédéric Chopin, Prelude for piano No. 7 in A (excerpt).

Process:

1) Compose a rhythmic ostinato of any length.
2) Apply it to your work. Do not incorporate other rhythmic values that are not part of the ostinato.

Guidelines:

1) Duration: at least 10 iterations of the complete ostinato.
2) Instrumentation: vibraphone, piano, marimba, or glockenspiel. Choose ONE from the given list.
3) In your score indicate tempo, articulations, dynamics, and all other specific indications for the chosen instrument.
4) All other parameters are free.

69

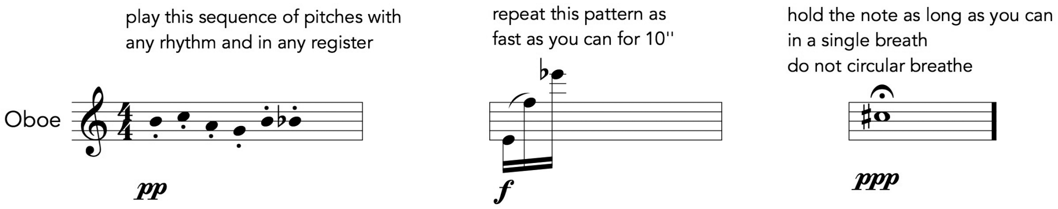
Exercise 69: Letting the Performer Make Decisions

In this exercise you will compose a short excerpt in which the **texture will be ultimately decided by the performers** based on a series of decisions left up to them. Performers will be given a variety of options on how and what to perform. Those options will be in the realm of tempo, dynamics, and articulations, therefore generating a myriad of possible (and radically different!) outcomes.

Process:

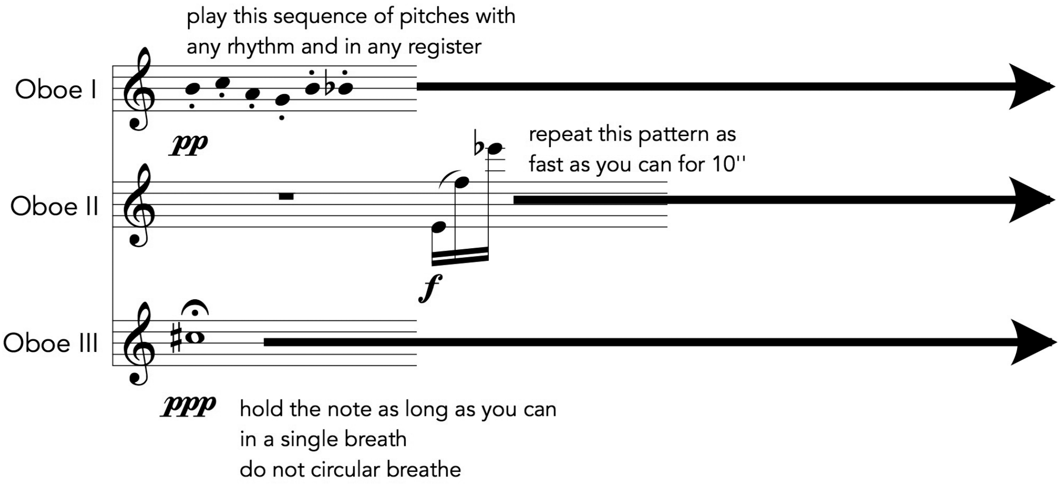
1) Create modules that incorporate some elements that are determined and others that are up to the performer's choice. Conceive the modules as frameworks, spaces where the performer *will* be composer (Figure 4.15).

Figure 4.15.
Modules for *aleatory* texture.


play this sequence of pitches with
any rhythm and in any register
repeat this pattern as
fast as you can for 10''
hold the note as long as you can
in a single breath
do not circular breathe
Oboe
pp
f
ppp

2) Combine those modules to create a texture (Figure 4.16).

Figure 4.16.
Modules combined.


play this sequence of pitches with
any rhythm and in any register
Oboe I
pp
repeat this pattern as
fast as you can for 10''
Oboe II
f
Oboe III
ppp
hold the note as long as you can
in a single breath
do not circular breathe

Guidelines:

1) Instrumentation: mixed trio (one brass, one woodwind, and one string).
2) Duration: between 1' and 2'.
3) Create the blocks (or modules) with the utmost clarity or intentional complexity.
4) When writing the instructions for the performers, make sure to anticipate *all* the possible outcomes.
5) All other parameters are free.

70

Exercise 70: Aleatory Counterpoint

In this exercise you will compose a short excerpt in which the **resulting counterpoint** will be ultimately decided by the performers based on a series of decisions left up to them. Performers will be given a variety of options on how to perform a given line. Those options will be in the realm of tempo, dynamics and articulations, therefore generating a myriad of possible (and radically different) outcomes.

For this particular example, the process will be demonstrated using one of J. S. Bach's two-part inventions. The goal is to appreciate how a highly contrapuntal texture can still keep the individuality and independence of the voices while blurring the strictness of the resulting vertical relationships.

Process:

1) Choose an excerpt where all the voices remain independent and have equal importance. The excerpt in Figure 4.17 is from J. S. Bach's two-part invention in D minor No. 4.

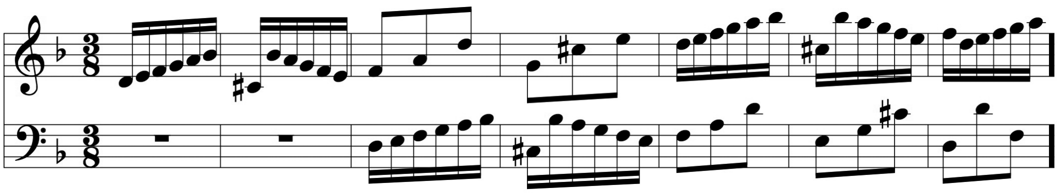


Figure 4.17. J. S. Bach, Two-part Invention in D minor (excerpt).

2) Incorporate some indications that will blur the strictness of the vertical counterpoint. Those could be related to tempo, durations, and pitch. You can also segment the individual lines (Figure 4.18).

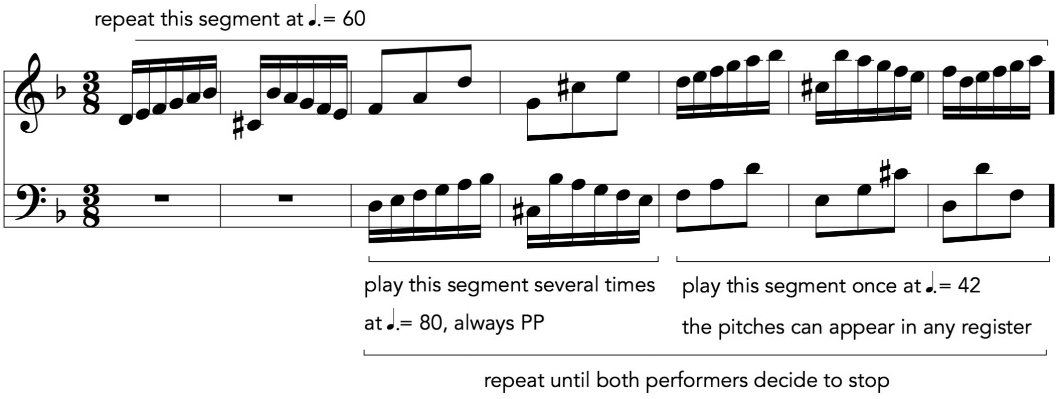

repeat this segment at ♩.= 60
play this segment several times at ♩.= 80, always PP
play this segment once at ♩.= 42
the pitches can appear in any register
repeat until both performers decide to stop

Figure 4.18. Bach's invention made *aleatory*.

Guidelines:

1) Duration: free.
2) Instrumentation: two woodwind instruments of your choice. In your score indicate tempo, dynamics, articulations, breath marks, and all the specific directions for the players.
3) Base your work on any of J. S. Bach's two-part inventions. Your exercise can use the complete invention or a part of it. Refer to your source clearly in your work (i.e., "this work is based on J. S. Bach's invention . . .").
4) All other parameters are free.

71

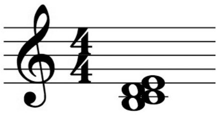
Exercise 71: Micropolyphony

In this exercise you will compose a short piece based on **micropolyphony**. Micropolyphony is a form of polyphonic musical texture associated with the music of György Ligeti, which consists of *many* imitative lines (built on small motifs) that displaced in time create dense vertical clusters. This technique can be found in *Lux aeterna* (1968).

Process:

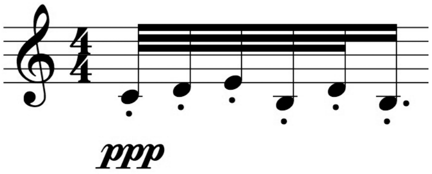
1) Decide (first) on a resulting cluster. This should be the desired sonority that will *result* when all the instruments perform their motifs (Figure 4.19).

Figure 4.19. Resulting cluster.



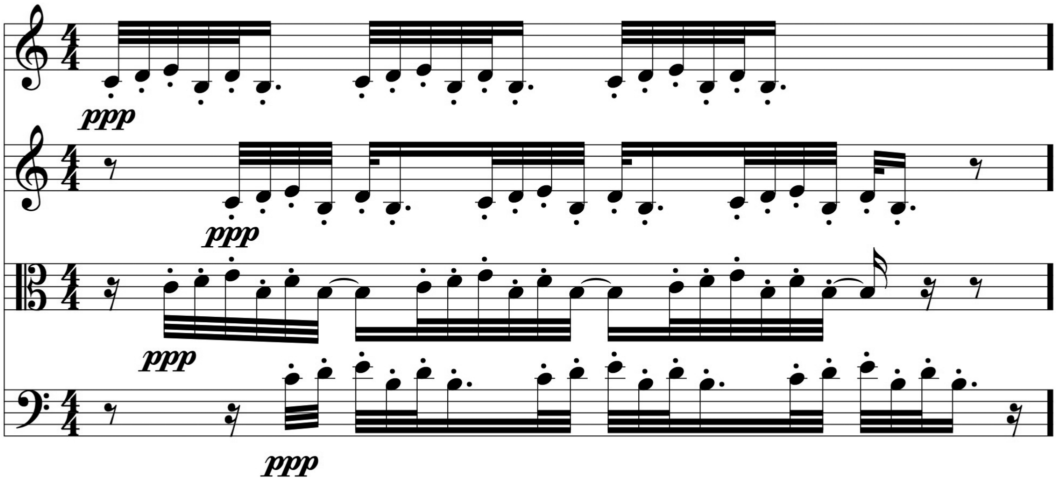
2) Create a simple motif that uses *all* of the pitches contained in the cluster (Figure 4.20).

Figure 4.20. Simple motif with notes of the resulting cluster.



3) Apply it recursively, displacing it in time in order to create a resulting cluster (with a high degree of internal imitation). In Figure 4.21 the motif is displaced by a sixteenth note.

Figure 4.21. Multiple motifs displaced in time.



Guidelines:

1) Duration: 20–22 measures.
2) Meter: 4/4.
3) Tempo: quarter note = 60.
4) Instrumentation: string quartet (two violins, viola, and cello). In your score indicate dynamics, articulations, tempo, phrasing slurs, and bowings.
5) Try the technique with other resulting sonorities that are not clusters.
6) All other parameters are free.

72

Exercise 72: Counterpoint, Appropriating from Fux's Species

In this exercise you will compose based on the model of Johann Joseph Fux's counterpoint of the **first species**. This type of counterpoint has a number of rules and guidelines that can be summarized as follows: 1) it must involve one note of the given melody (cantus *firmus*) per note of the counterpoint; 2) it must start and end on a perfect consonance; 3) the only vertical intervals allowed are consonances (i.e., third, fifth, sixth, and octave); 4) there should be a good balance between the possible available consonances; and 5) perfect consonances can be approached by oblique or contrary motion, not similar (parallel or otherwise).

Guidelines:

1) Considering the summarized set of rules for a counterpoint of the first species, *create your own set of rules* that address the same topics:
    a. How many notes should be against the given melody?
    b. Which is the interval required for the beginning and end?
    c. What are the vertical intervals allowed?
    d. Should there be a good balance between all the permitted intervals? Make a consideration (or suggestion) about this topic.
    e. Is there any interval (or set of them) that cannot be approached in similar motion (e.g., your rules can forbid the use of parallel 3rds)?
    f. How long should the complete work be?
2) Instrumentation: any duo of the same instrument (i.e., violin duo, clarinet duo, cello duo). In your score indicate tempo, character, articulations, transposition (if applicable), and all other pertinent idiomatic indications.
3) **When composing, be extremely strict with the rules you created after Fux's model!**
4) All other parameters are free.

73

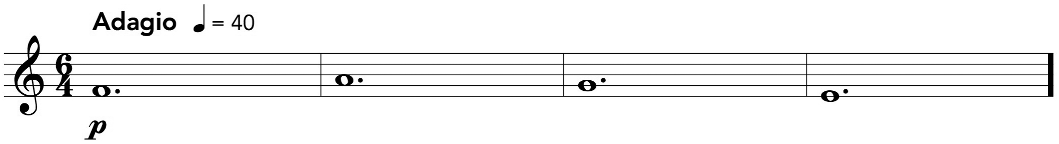
Exercise 73: Counterpoint "Tree"; 1:1, 1:2, 1:3, and Others Combined

In this exercise you will compose a **contrapuntal texture** based on a model built after the different rhythmic possibilities of Johann Joseph Fux's species. In his *Gradus ad Parnassum*, Fux proposes a rhythmic system of increasing complexity based on the number of notes that the counterpoint presents *against* the given melody. The first species is 1:1 (i.e., one note of the counterpoint per note of the given melody), the second species is 1:2 (i.e., two notes of the counterpoint), the third species is 1:3 or 1:4 (i.e., three or four notes of the counterpoint again one of the given melody). For this exercise you will create a **contrapuntal "tree"** in which each of the individual voices will be a subdivision of a given melody.

Process:

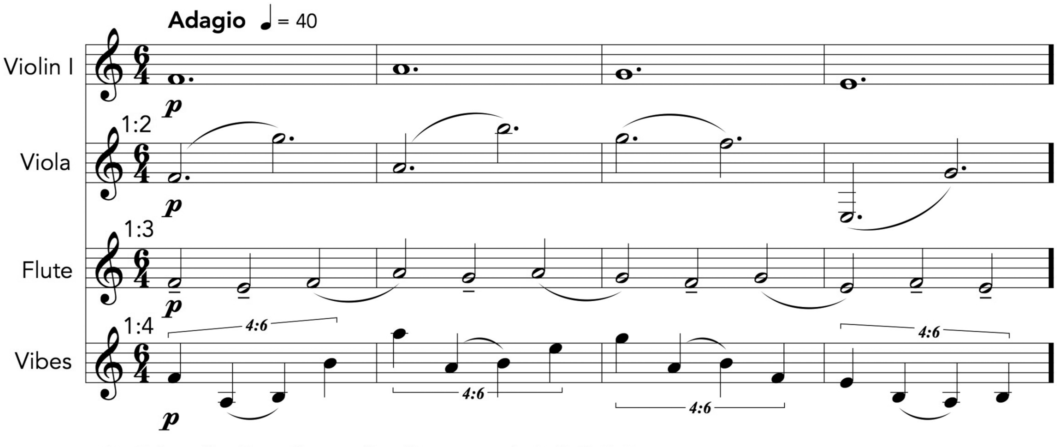
1) Compose a simple given melody (Figure 4.22).

Figure 4.22.
Simple melody for "contrapuntal tree."



2) Establish a set of rhythmic relationships against the given melody: 1:2, 1:3, and 1:4.
3) Choose: pitch collection and an interval of attack (this interval will occur ALWAYS between ALL the voices in the downbeat of EVERY measure). For this example this will be the perfect octave or the unison.
4) Create a texture that combines all the rhythmic and intervallic components chosen (Figure 4.23).

Figure 4.23.
Possible resulting texture.



* pitch collection chosen for this example F A G E B

Guidelines:

1) Mixed ensemble: the ensemble should include a combination of pitched percussion instruments and woodwinds of at least four instruments.
2) Duration: eight to ten measures.
3) Meter: 12/8.
4) Tempo: dotted quarter note = 50.
5) Each of the voices **must clearly show** its rhythmic proportion (i.e., 1:3, 1:7, etc.).
6) In your score indicate articulations, dynamics, tempo, choice of mallets, and all other idiomatic requirements for the chosen instruments. Present your score transposed.
7) All other parameters are free.

74

Exercise 74: Same Chord, Different Color (Orchestration)

In this exercise you will compose a short excerpt focusing exclusively on the change of **orchestrational color.** Without changing the pitch content, the exercise proposes a framework to explore color changes by means of dynamics and instrumental forces.

Guidelines:

1) For this exercise, you should choose a chord of four different pitches. All of them (preferably) should be possible in all the chosen instruments.
2) Instrumentation: mixed ensemble (one string, one woodwind, one brass, and one pitched percussion). In your score indicate dynamics (vital), articulations, tempo, and other idiomatic indications for the chosen instruments (bowings, pedal, breath marks, etc.).
3) Duration: repeat the same chord at least 10 times with different orchestrations (DO NOT repeat any of them). Rotate the instruments, conceive combinations of different dynamics, use multiphonics, double stops in the strings, multiple notes in the pitches percussion, and so on.
4) DO not change the pitches (or the register) of the chord that is re-orchestrated!
5) All other parameters are free.

75

Exercise 75: The Magic of the Unison and Timbral Modulation

In this exercise you will compose a melody with **timbral modulations.** A timbral modulation is the change in the timbre (or color) of a given line. This result can be achieved with the implementation of < > and dynamics changes on a melodic line played at unison by several instruments.

Process:

1) For this exercise, you can bring back any of your solutions to the exercises (1–20) in the chapter about melody. You can also create a new melody (Figure 4.24).

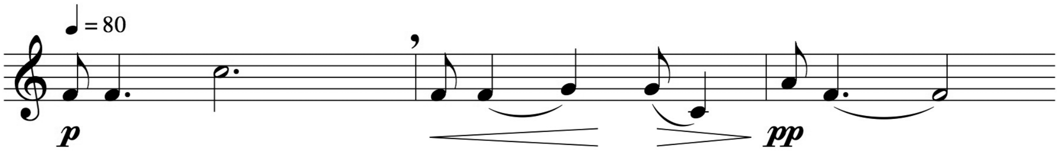
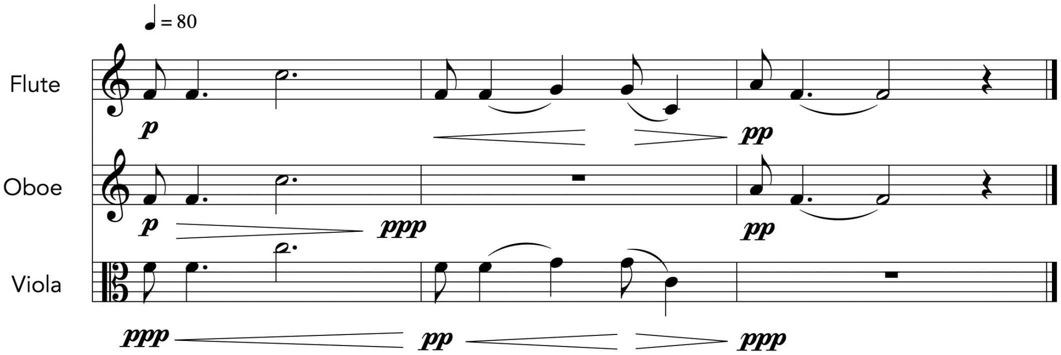


Figure 4.24. Benjamin Britten, *Serenade: Prologue* (excerpt).

2) Decide on the instrumentation (for this example, it will be a mixed ensemble of flute, oboe, and viola).
3) "Color" the melody using crossfades or different combination of unisons (Figure 4.25).

Figure 4.25.
"Colored" melody.



Guidelines:

1) Duration: 12–16 measures. You can use one of the melodies in Appendix C, any of your solutions to the melody exercises, or compose a new one.
2) Instrumentation: mixed ensemble between three and six players. This ensemble should include instruments from at least three different instrumental families (i.e., one string, one woodwind, and one brass; or one string, two woodwinds, and one percussion).
3) In your score indicate transposition (if applicable), dynamics, tempo, articulations, and all other idiomatic requirements for the chosen instruments.
4) Have at least four timbral changes. Mark them clearly in your score.
5) All other parameters are free.

76

Exercise 76: Volume of Orchestration

In this exercise you will compose and experiment with the concept of **orchestrational volume**. Orchestrational volume can be defined as the number of instruments that perform a single line at unison (e.g., a volume of three would indicate that three instruments play the same line at unison). The changes of volume can be radical or gradual. In the first case, one or more instruments are added or subtracted; in the second situation, a < or > can add or subtract an instruments gradually. A particular case happens when two instruments that play at unison perform a crossfade (i.e., when one < the other one >), in that situation there is a change of color but not of the orchestrational volume.

Process:

1) Decide on the instruments involved.
2) Design a possible sequence of orchestrational volume (i.e., 1–2–1, etc.).
3) Apply the sequence to the given melody using the chosen instruments. This example shows both a modulation (gradual change of volume) and an abrupt change. Consider that a at a crossfade (when two instruments have simultaneous opposing dynamic < >), the volume does not change (Figure 4.26).

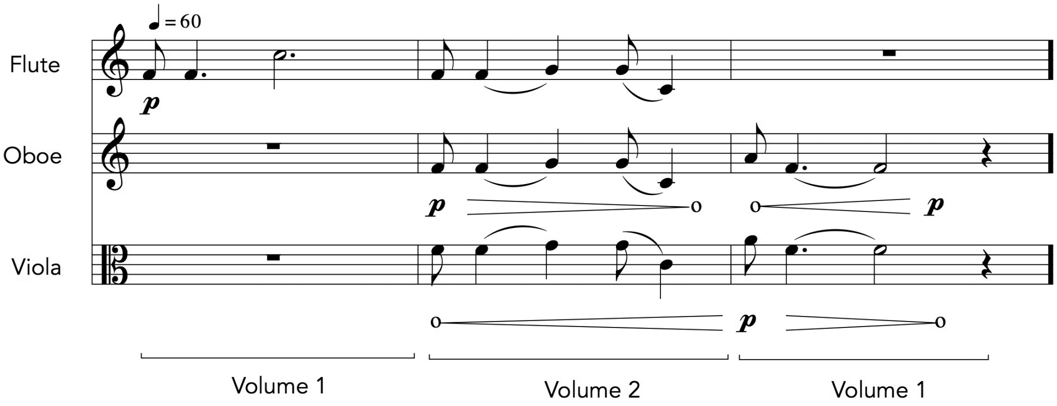


Figure 4.26.
Volume of orchestration.

Guidelines:

1) Duration: 10–12 measures.
2) Tempo: quarter note = 60.
3) Meter: 4/4.
4) Create a sequence of orchestrational values of five to eight changes.
5) Instrumentation: mixed ensemble between three and six players. This ensemble should include instruments from at least three different instrumental families (i.e., one string, one woodwind, and one brass; or one string, two woodwinds, and one percussion).
6) In your score indicate tempo, character, articulations, and other specific techniques for the chosen instruments. Present your score transposed.
7) Show in your score the sequence of values for the orchestrational volume.
8) All other parameters are free.

77

Exercise 77: Text Painting, Representing Text with Sounds

In this exercise you will compose a new work or an excerpt applying **text painting**. Text painting is a technique that involves a sonic depiction of an imagery contained in a written text. This sonic depiction involves a metaphorical connection between text and sound. In music, some of the most commonly used conceptual metaphors refer to motion (ascending/descending pitch), color (bright/dark harmonies or textures), tension-release (dissonance/consonance, irregularity/regularity of rhythm, focal point of a melody), pace (fast/slow tempo), equality (12-tone row), and nature (birdsong, the elements, soundscapes).

Hugo Wolf pictured the movement of fire with an ascending melodic line with an irregular rhythmic structure that represents the capricious behavior of a candle light. Schubert used a relentless rhythmic ostinato to depict the horse gallop in his *Erlking*. In one of the well-known bass solos of his *Messiah*, Handel used ascending melismatic lines that cadence in major chords to represent light and descending figures that outline minor triads to represent darkness. In his arrangement of *Joshua Fit the Battle of Jericho*, Moses Hogan split the choir into two groups that emphasize different aspects of the text to symbolize the opposing forces in a battle.

Process:

1) Choose a text with an image that is meaningful for you. Explore poetry books, textbooks, and other unexpected sources such as Twitter and Facebook!
2) Establish YOUR connections between the text and the music. Write a paragraph or two about them and the metaphor employed. How is the text going to inform your composition? Be precise, technical (if needed), and avoid generalities.
3) Decide on the instrumentation that YOU consider the most appropriate for your image.
4) Compose!

Guidelines:

1) Choose a text by someone else (do not use yours). Include it in your score.
2) Duration: free. Everything in your composition should be related to the image contained in the text.
3) Instrumentation: should be informed by the image.
4) In your score indicate tempo, dynamics, articulations, and other specific techniques for the chosen instruments. Include in your work a paragraph or two where you describe the connections that you established between the text and the music.
5) All other parameters are free.

78

Exercise 78: Heterophony

In this exercise you will compose employing **heterophony**, a type of texture characterized by the simultaneous independent layers that are transformations of the same musical idea. In other words, it is a type of texture that simultaneously presents musical material and its transformations.

Process:

1) Choose musical material as basis for the texture. This material could be of any kind (i.e., rhythmic, melodic, etc.) and can be extracted from the excerpts contained in Appendix C.
2) Transform that material applying any technique. For this exercise, always transform the original material, not the one already transformed.
3) In your score, place the original material and its transformations in vertical simultaneity to generate a heterophony.

Guidelines:

1) Instrumentation: mixed ensemble. Use four or more instruments that represent at least three of the instrumental families.
2) In your score indicate dynamics, articulations, tempo, and other specific technical indications for the chosen instruments. Additionally, show which transformational technique was applied for each instrument (i.e., transposition by three semitones up, × 2.1 of all rhythmic values, retrograde inversion, etc.).
3) Duration: 12–20 measures.

4) Meter: should change at least twice.
5) All other parameters are free.

79

Exercise 79: Using Stratified Layers à la Ives

In this exercise you will compose a short excerpt applying a **layered (or stratified) texture** in which each of its components is presented arbitrarily in vertical simultaneity. These textural components are not a transformation of the same material, and can have different meters, tonal centers, and themes. In a broad sense, this type of texture presents diverse musical material that is only related by its temporal coexistence. Examples of this technique can be found in the music of American composer Charles Ives (e.g., *Three Places in New England*, Symphony No. 1).

Process:

1) Compose three or more independent musical fragments of similar duration. Consider *recycling* outcomes from previous exercises, you can (and should) bring back your own solutions to any of the exercises contained in this book.
2) Place them in vertical alignment in a score format. Consider that these elements *can* have features in common but should not be a transformation of the same musical idea.

Guidelines:

1) Instrumentation: mixed ensemble with conductor (one woodwind, one brass, one string, and piano). In your score indicate dynamics, articulations, transposition (if needed), breath marks, bowings, and any other idiomatic indication for the instrumental forces used.
2) Duration: free.
3) Meter: each of the fragments involved may have a different time signature. Without compromising the independency of the lines, consider the practicality of the performance of your work. Use a notation that facilitates the assembly of your work without neutralizing the layered texture.
4) Include with your work a diagram with the distribution of the instruments on stage and the desired location for the conductor.
5) Make sure that your writing is precise and exhaustive; do not leave compositional decisions to the performers. This should not be an exercise in *aleatory* counterpoint.
6) All other parameters are free.

80

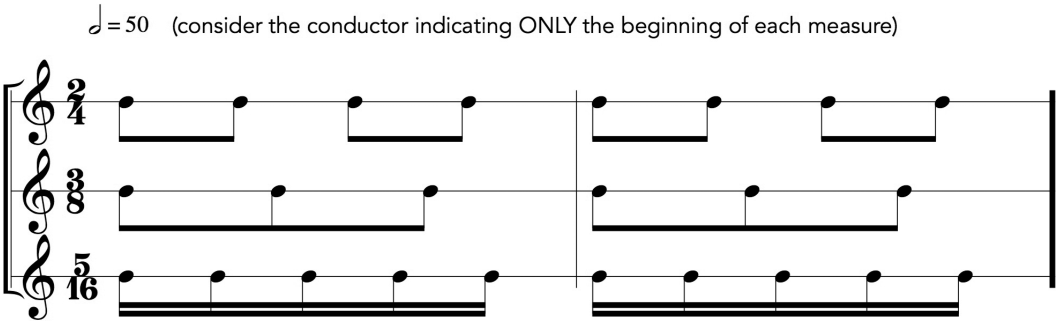
Exercise 80: Sound Masses

In this exercise you will compose a short **sound mass** in which you will control its density per unit of time. Here the unit of time will be the measure (regardless of its time signature) and the density will be given by the number of events (attacks) that occur within that unit. An interesting example of the approach proposed in this exercise can be found in Iannis Xenakis's *Metastasis* (1953) at m. 104.

Process:

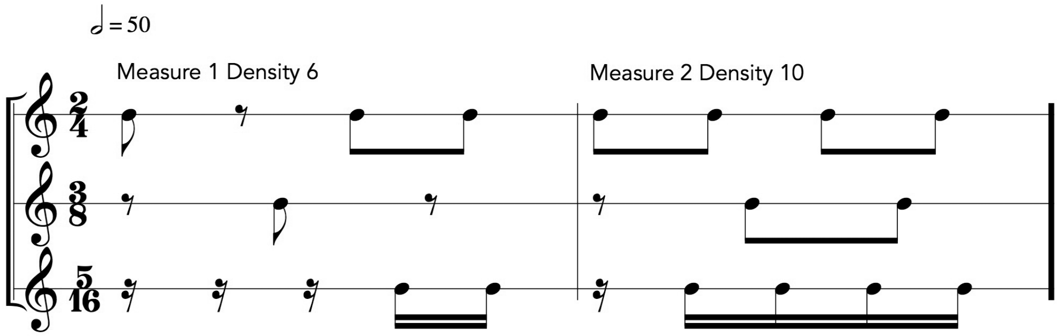
1) Create your unit of time and then divide it in unequal parts with the use of different time signatures (Figure 4.27).

Figure 4.27. Unit of time subdivided according to the time signature.


𝅗𝅥 = 50 (consider the conductor indicating ONLY the beginning of each measure)
2/4
3/8
5/16

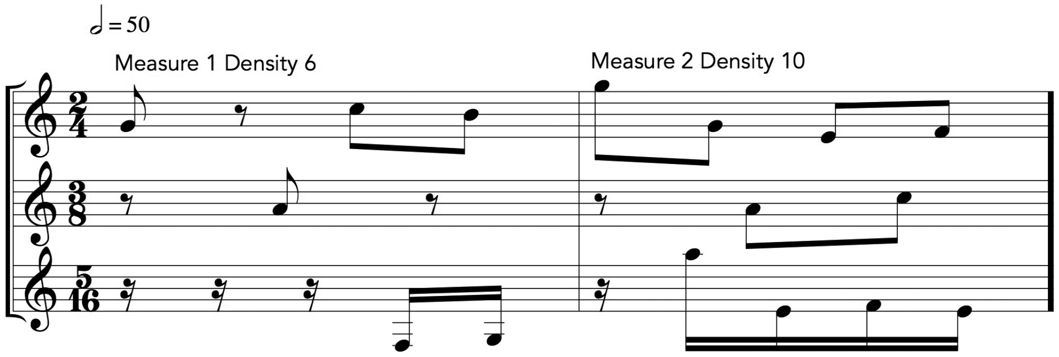
2) Decide on a density value per unit of time. In the example the possible range would be between 0 (no events) and 10 (all events). The values for this example will be 6 and 10.
3) Compose a rhythmic structure that fulfills the density values (Figure 4.28).

Figure 4.28. Events/unit of time to represent density.


𝅗𝅥 = 50
Measure 1 Density 6
Measure 2 Density 10
2/4
3/8
5/16

4) Assign pitches (freely) to those rhythmic values (Figure 4.29).

Figure 4.29. Density with assigned pitches.


𝅗𝅥 = 50
Measure 1 Density 6
Measure 2 Density 10
2/4
3/8
5/16

Guidelines:

1) Instrumentation: brass quintet (two trumpets, trombone, French horn, and tuba). Indicate articulations, dynamics, and other idiomatic techniques for the chosen instruments.
2) Duration: no more than 1'.

3) In your score clearly specify the density values per unit of time.
4) Your sound mass should have a variable degree of density, using both the minimum and maximum degrees available. Remember that the degree of density in this exercise refers to the number of onsets (attacks that are not in synch) per unit of time (measure).
5) All other parameters are free.

5

Form (Exercises 81–90)

Preliminary Notes

The form of a composition is generally associated with its structure and evolution in time. The duality between similarity and contrast is vital when analyzing or composing form. Similarity denotes the continuity of a given section (or material), while contrast implies the beginning of something different or new. Traditionally, musical form uses labels in order to refer to sections of a composition that are identical (i.e., A and A or 1 and 1), similar (i.e., A and A', or 1 and 1.1) or completely different (i.e., A and B or 1 and 2). This convention is useful and emphasizes one of the main goals of this chapter, which is to develop a sense of awareness and control for similarity and contrast.

Exercise 81 is based on the idea of contrast between sections; the goal of number 82 is to work with music blocks or modules; 83 is focused on the concept of developing variations as a formal approach (the variation of the variation). Exercise 84 brings back the traditional concept of variations on a theme; similarly, number 85 uses the traditional rondo form as a model. In 86 the core is the use of repetition as in minimalist music; 87 proposes an exercise about palindromic formal structures. Based on Earle Brown's *Available Forms*, number 88 proposes a framework to challenge the idea of musical form as a fixed entity; 89 is about composing monolithic structures. The last exercise of the chapter, number 90, offers the opportunity to compose and explores ruled-based game compositions.

Exercises

81

Exercise 81: Planning Contrast

In this exercise you will compose two short **contrasting** sections for solo instrument. The contrast will be planned and decided in advance using a chart. Note: since the perception of contrast can be subjective, a discussion with the instructor after the completion of the exercise is highly recommended.

Guidelines:

1) Instrument: vibraphone (check its register in Appendix D).

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2) Duration: between eight and ten measures per contrasting section.
3) All other parameters not defined in your chart or in the guidelines are free.

Process:

1) Create a chart with the specifics for several parameters (that you will "contrast") per section, following the example in Table 5.1.

Table 5.1. Sections with contrasting parameters.

	Contrasting sections	
Parameter	*Section 1*	*Section 2*
Tempo	q = 60	e = 144
Dynamics	p	ff
Register	Med-low	Extreme high
Texture	Only chords of three notes	Single repeated note
Pitch content	F major pentatonic (F, G, A, C, D)	Only one pitch (chose one not used in section 1)
Meter	4/4	5/8

2) Based on your chart compose the two contrasting sections for solo vibraphone.

Figure 5.1. shows one of the many possible solutions following the chart of Table 5.1.

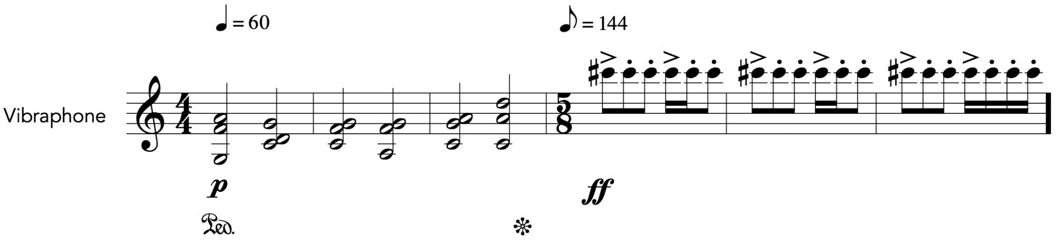


Figure 5.1. Possible solution of contrasting sections.

82

Exercise 82: Composing with Modules

In this exercise you will compose using **pre-composed modules**. Inspired by compositional games such as Mozart's dice game, this exercise proposes a compositional approach that places the composer in the role of an architect, a builder of sonic bricks. The premise of this challenge is to first create the materials (musical blocks) and then organize them in any way to create a larger structure.

Process:

1) Create independent blocks of four beats or fewer. These blocks can but do not have to be a transformation of the same musical idea. They can be silence, complex textural material, a short melody, and so on (Figure 5.2).

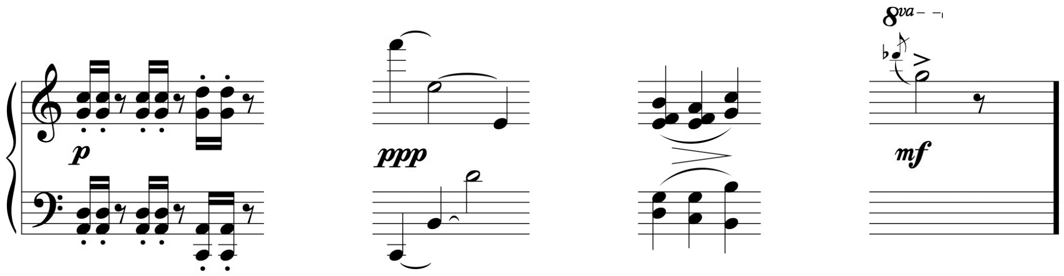


Figure 5.2. Four contrasting modules.

2) Place the blocks in any sequence to create a larger construction (Figure 5.3). Make sure to not change the content of the blocks or add any extra material not contained in them!

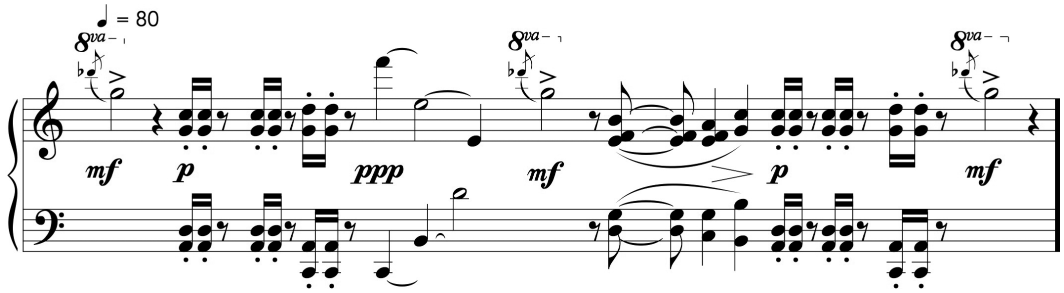


Figure 5.3. Structure based on modules.

Guidelines:

1) Create ten independent blocks of four beats or less and combine them to create a larger structure. Do not add extra material or modify the content of the blocks.
2) You must use all the blocks that you created at least once. You can repeat any of them if desired.
3) Instrumentation: solo piano.
4) Duration: between 1' and 1'30''.
5) In your score indicate articulations, dynamics, pedal and tempo markings, character, and so on.
6) All other parameters are free.

83

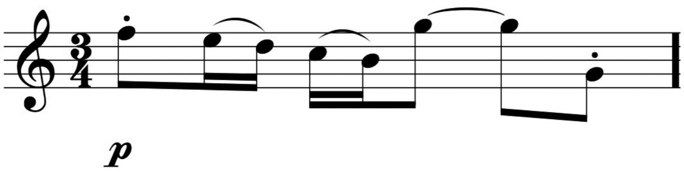
Exercise 83: The One-way-trip Composition, Developing Variations

In this exercise you will transform a musical idea recursively. Starting from a simple motif, this exercise proposes an approach to the concept of the **developing variation**, in which the original motif is constantly transformed.

Process:

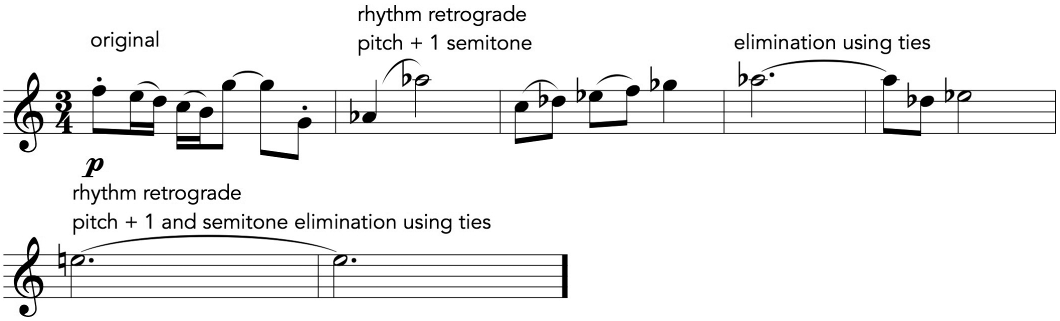
1) Create a one-voice motif (Figure 5.4).

Figure 5.4.
One voice simple motif.



2) Elaborate a list of the transformational procedures that will be applied. Mind the order! Here you can refer to any of the processes used in exercises 1–40 or create your own.
   a. Rhythm retrograde/pitch +1 semitone.
   b. Elimination using ties.
   c. Rhythm retrograde/pitch +1 semitone/elimination using ties.
3) **Apply the transformations recursively to the latest transformation of the motif.** The final result should evoke the compositional idea of a spiral, a transformation of the transformation, or a developing variation (Figure 5.5).

Figure 5.5.
Example of developing variation.



Guidelines:

1) Instrument: solo clarinet in B♭.
2) Duration: at least five transformational procedures.
3) In your score indicate tempo, dynamics, articulations, and breath marks. Also mind the register and transposition of the instrument, present your work transposed.
4) Mark in your score where each of the transformations start and make a short clarification of the process employed (i.e., transpositions –2 semitones, multiplication ×3 of all the rhythmic values, and so on).
5) Remember that the goal of this exercise is to *transform the transformations*.
6) All other parameters are free.

84

Exercise 84: Theme and Variations

In this exercise you will plan and compose a short **set of variations** to a given theme. The variations will be strict transformations of a given theme using some of the techniques from the chapters on melody, harmony, or rhythm.

Process:

1) Choose a theme from Appendix C or write your own (Figure 5.6).

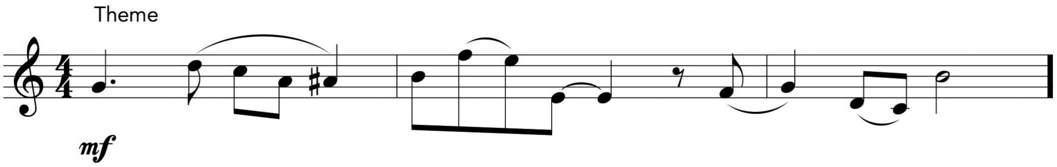


Figure 5.6.
Sample theme.

2) Decide on a technique to apply (for this variation all the rhythmic figures will be divided by 2).
3) Transform the theme accordingly (Figure 5.7).

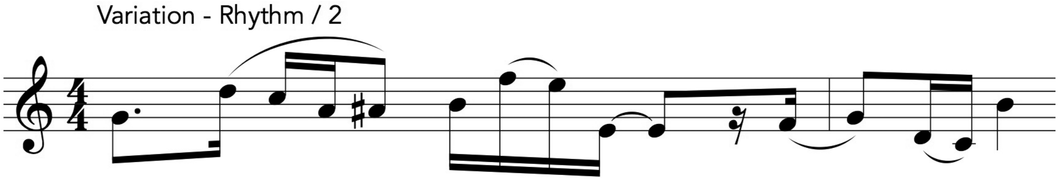


Figure 5.7.
Sample variation.

4) Apply a different transformational technique to the theme to compose more variations.

Guidelines:

1) Choose a theme from Appendix C or write your own.
2) Duration: between five and eight variations on the theme.
3) Instrumentation: solo bassoon.
4) In your score indicate tempo, articulations, dynamics, and other idiomatic indications for the given instrument.
5) All other parameters are free.

85

Exercise 85: Spinning around A, Rondo?

In this exercise you will compose a short piece based on the formal outline of a **rondo**. A rondo is a musical structure where the initial material (refrain) keeps returning throughout the work. A possible diagram of a rondo could be A B A C A D A, where A is the material that keeps "coming back" around the contrasting sections.

Process:

1) Compose a refrain (recurring material) between one and three measures long.
2) Compose contrasting sections around that refrain. Those sections can be of any duration, and they must contrast both with the refrain and with each other.
3) Place them sequentially to create a larger structure (e.g., A B A C A D A). In the example A is the refrain.

Guidelines:

1) Instrumentation: solo piano or keyboard percussion.
2) Duration (structure): A B A C A D A or A B A C A D A E A.

3) In your score indicate dynamics, articulations, tempo, character, and other idiomatic indications for the instrument of choice (i.e., type of mallets if you write for vibraphone).
4) Meter: 9/8 or 15/8.
5) All other parameters are free.

86

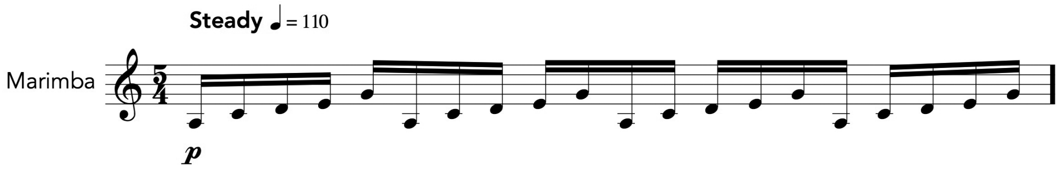
Exercise 86: Form as Process, Minimalism

In this exercise you will compose ***minimalist* or *repetitive* music**. This compositional approach employs very limited or *minimal* musical material. The goal of this exercise is that you manage to reveal—throughout the composition—how the piece is composed. The form of your work should strive to reveal the compositional process.

Process:

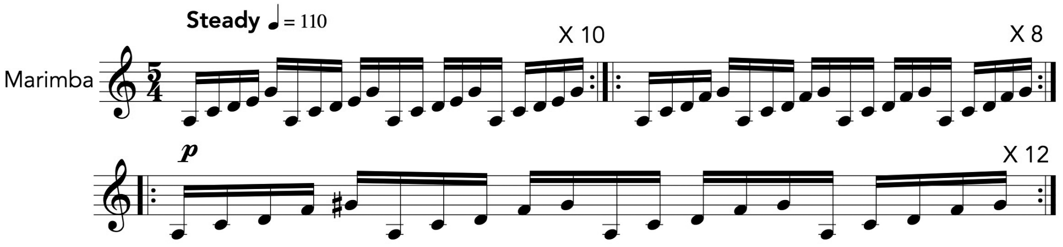
1) Compose a simple musical idea that will repeat a number of times (or that will be performed during a lapse of time) (Figure 5.8).

Figure 5.8.
Musical idea for minimalist piece.



2) Make gradual, small changes to this material repeating those changes as well. Apply one change at a time; repeat the morphed material before making the subsequent transformation (Figure 5.9).

Figure 5.9.
Sample of minimalist composition.



Guidelines:

1) Instrumentation: solo marimba.
2) Duration: between 4’ and 10’.
3) The transformations of the initial material *should involve only one element at a time* and *be cumulative*.
4) In your score indicate dynamics, articulations, tempo, character, and type of mallets.
5) Meter: 5/4 but can change to complement the transformations.
6) All other parameters are free.

87

Exercise 87: Palindromic Structures

In this exercise you will compose a new work with a **palindromic** structure.

Process:

1) Compose a section of a work. Figure 5.10 shows the first three measures of the first movement of Mozart's Piano Sonata in A, K. 331.

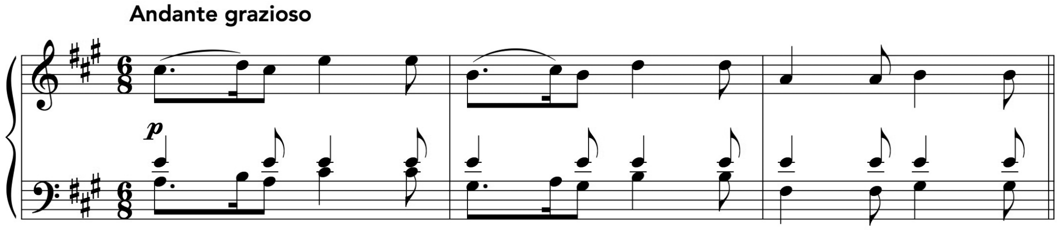


Figure 5.10.
W. A. Mozart, Piano Sonata in A, K. 331 (excerpt).

2) Create its "mirrored image" by reversing (putting into retrograde) the order of the material. You should end with the section's initial material and the duration should be exactly twice as long as the material that you originally composed (Figure 5.11).

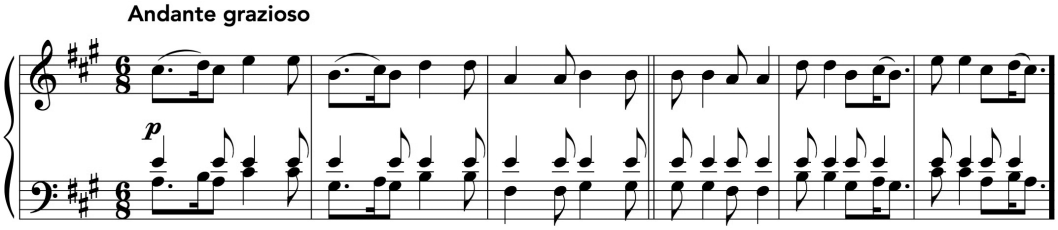


Figure 5.11.
Palindromic Mozart.

Guidelines:

1) Duration: twice the length of the original material. The original material can be of any duration.
2) Instrumentation: violin and piano.
3) In your score indicate dynamics, articulations, tempo, character, bowings, pedal, and any other idiomatic indications for the instruments involved.
4) Indicate with a double bar the beginning of the middle point of the piece (i.e., the beginning of the retrograde).
5) All other parameters are free.

88

Exercise 88: Available Forms à la Brown

In this exercise you will compose a work after the formal model proposed by Earle Brown in his work ***Available Forms***. This work is structured as independent modules that are ordered (at the moment of the performance) by the conductor. The available forms refer to the possible sequences that can be created by ordering and re-ordering the finite number of pre-composed modules.

Process:

1) Compose between four and eight independent short modules for the same given instrumentation and number them.
2) Decide on a method to use the pre-composed modules to generate musical structure. This sequence could be decided in performance by the conductor (or one of the performers of the ensemble), by throwing dice, using a random number generator, using cards (or signs) to indicate the section to follow, and so on.
3) For this exercise the composition is completed when the modules are finished and a system to organize them has been created.

Guidelines:

1) Instrumentation: mixed ensemble of your choice. Use any number of forces; at least three different instrumental families must be represented in your mix.
2) Duration: between five and ten modules.
3) In your score indicate the process for the performance. Will there be a conductor? Will the conductor decide the next module to play? Can the members of the ensemble decide not to play what the conductor indicates? Will there be some overlap between modules? How is that going to be indicated? Would that be in the score or would be a suggestion for the conductor or the players? How does the piece end?

89

Exercise 89: Monolithic Structures

In this exercise you will compose a work with a **monolithic** structure. The term monolithic here refers to a type of musical structure or form built upon a single idea. A monolithic piece can be represented with a diagram of a single letter, with only one section (i.e., A) and no contrasting sections. An example could be a solo piano piece that gradually (and exclusively) goes from the highest note to the lowest note of the instrument. The only purpose of the work is to *do* something, to take the listener throughout the complete range of the piano.

Process:

1) Imagine and write three to five possible goals or single ideas for a new work. Ask yourself: What do I want the piece to do? What is "the thing" that I want the piece to show? Can I use the work to illustrate one facet of the performing force(s)? Is the new piece going to show a shape? Or a color?
2) Choose one of those ideas.
3) Write a piece that only *does* what you planned. Think that this new work is not about contrast but about showing "the thing" that your piece *does*.

Guidelines:

1) Instrumentation: free.

2) Duration: the piece ends when the idea for the work has been exhausted or its goal achieved.
3) All other parameters are free.

90

Exercise 90: Game Pieces

In this exercise you will compose a **"game" piece**. An essential characteristic of so-called game pieces is that there is no pre-arranged sequence of events. They unfold freely according to certain rules, like in any game. Therefore, game pieces can have elements of improvisation, chance, and indeterminacy. A number of methods can be used to determine the direction and evolution of the music. Under the same term of "game piece," composers have taken quite diverse approaches. On the one hand, Iannis Xenakis in his *Duel* (1959) and *Strategie* (1962) proposes a strict set of rules for two orchestras, determining how to score points and value the tactics, and a jury to determine which of the participating (competing) ensembles is the winner. On the other hand, John Zorn conceived the game piece as a space for sociological experimentation. In *Cobra* Zorn establishes a system of cards and hand gestures intended to govern the development of the piece. Zorn does not propose a game where a team (or a player) wins but a trajectory where individual performers or groups engage in a sonic battle to control the evolution of the work.

Process:

1) Imagine a game and its rules. Ask yourself: Will this game have a goal? If so, what would that be? A collective composition? Will there be points? Will there be a winner performer or group at the end? How will the game evolve? Will there be turns (between players)? Will there be a conductor making some of those decisions regarding the unfolding of the work? How will the game come to an end? Can the players refuse to follow the rules? How many performers will this game involve? Will it be for a specific or open instrumentation?
2) Write down the rules.
3) Decide on a method that you consider the best fit for the rules that you have elaborated. Will this sound game involve cards, dice, physical gestures, a randomizer, a board, a musical score with general suggestions?
4) Translate the rules to the system that you chose. Have in mind that this process is flexible and can be altered in a variety of ways.

Guidelines:
For this particular exercise, the guidelines are embedded in the process and vice versa. The rules of the game will determine its length; the participants (and instruments) will determine the orchestration, and so on.

6

Pre-compositional Strategies (Exercises 91–100)

Starting a New Composition: Challenges and Possible Solutions

The prospect of starting a new composition can be captivating and empowering. You—the creator—have full control of all its aspects. Duration, speed, character, color, instrumentation, and *every feature* of the new work are under your control, waiting to be determined. You are the architect of a new invisible sonic city.

This opening process is extremely exciting but can present some challenges. The number of options available in the pre-composition stage (before even writing the very first note!) can be daunting. Let's imagine a potential piece for solo piano. We have 88 possible pitches from which to start; which note do we choose? C4, C7, or B3? The possibilities expand even more if we think about a dyad: which two notes out of the 88 are we going to write first? How about a triad, or a single note followed by a triad and then a dyad. What are our options in that scenario?

In addition to the first few pitches, we also have to decide their rhythm and that can be an even harder decision to make. If we agree that rhythm is the temporal organization of a composition and also concur that the distance between two points can be divided to infinity, we must accept that we do have infinite options when deciding on the rhythm of a piece; there are indeed infinite possibilities!

Starting a new piece can become an extremely gratifying process if the options are constrained. A good idea could be to limit the creative framework. Having fewer options can be of help. Those initial boundaries are to set up an initial spark in your imagination and can be modified at a later time.

Some talk about *inspiration*, and how it can help start a new composition. While inspiration can be extremely resourceful and fueling, it can also be limiting, with long periods waiting for it to come. The sparks for a new piece can originate in past *experiences*: memories, books, sounds, smells, pieces that had an impact on you, situations, trips, flavors, people, some technology. Inspiration can be exercised and nurtured every day. *Do*, *experience*, cultivate your sonic imagination.

The exercises and strategies contained in this chapter are based on the idea of constraints, limiting your framework in order to free your art and, more importantly, to be able to begin a new composition.

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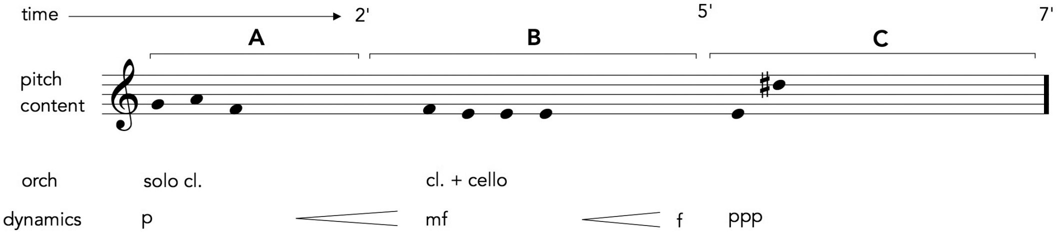
Formal Plans

A new composition can be imagined and conceived—completely in the abstract—with the assistance of a formal plan. In this situation, the plan can help one imagine the complete overall trajectory of a new work without thinking about specifics. Questions can help organize a thought process from the global to the specific. How many sections is the new piece going to have? What is the duration (in minutes and seconds) of each section going to be? Which instruments are going to be used in each of the sections, in which role? Will there be a solo somewhere? Which instrument? Are rhythmic and melodic motifs going to characterize each section? How about the texture? Meter and tempo?

Sketches can look bare; however, they show vital components of the form and its proportions that provide an initial map of how a new work will unfold in time. Figure 6.1 shows a simple plan for an imaginary piece of three sections of dissimilar duration scored for mixed ensemble.

Figure 6.1. Model of a formal plan.



Using Matrices and Vector Graphics

Some exercises in melodic construction propose the use of matrices. In those cases, they help decide on the "probable" notes to follow a given one, to write a melody following the order of a given set of pitches. In addition to that, matrices can also be employed in a variety of ways to generate arbitrary associations within the composition. The matrix in Table 6.1 informs the composer about the possible registers for each of the pitches of the chromatic scale. In the new work, the pitch C can only appear in octave 5; C♯ in octaves 1, 2, or 7; D in octaves 2 and 3; and so on.

Table 6.1. Serialized registral options.

		Possible octave designation (1 to 7)						
		1	***2***	***3***	***4***	***5***	***6***	***7***
Note of chromatic scale	C					•		
	C♯	•	•					•
	D		•	•				
	D♯			•	•			
	E				•	•	•	
	F		•			•	•	
	F♯				•			
	G			•	•	•		•
	G♯					•	•	
	A	•			•	•		•
	A♯							
	B		•					•

Vector graphics can be a helpful way to narrow the compositional framework. They can also help visualize the evolution of musical parameters in time (see Figure 6.2) or in relation to other parameters. Additionally, the implementation of simple *x* and *y* graph can provide interesting ideas on how to "sonify" a picture or a graphic score.

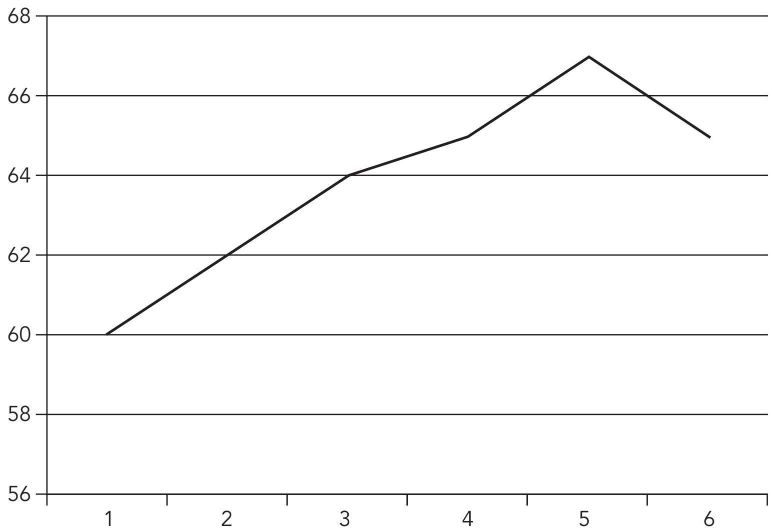


Figure 6.2.
Vector graph of a simple melody. The *x* represents time and the *y* pitch (in MIDI notes).

Analysis and Stylistic Imitation

Analysis and stylistic imitation can be useful tools to starting a new composition. Through musical analysis, you can acquire a deeper understanding of a given composition, and then reapply it in your own work. Using the results of analysis to inform your own work has been a common resource for composers. If you hear a particularly engaging harmonic progression or voicing, go to the score, analyze it, and embed it in your work.

Stylistic imitation can also be of help. Similarly to the use of analysis, the study of a composer's style (or voice) requires a larger understanding and awareness of their body of work. That said, a composer's style could be approached in a variety of ways (some of them contradictory): does style represent consistency—the trademarks that the artist uses more often—and how they are implemented? Does it represent a composer's most popular work? Can style be summarized in a characteristic technique or motif that we immediately relate to a composer? Are the first few bars of Beethoven's Fifth Symphony representative of his style? Is the beginning of Mozart's 40th Symphony a trademark of his style?

Despite the challenge of attempting to find a definition to style, we can still use the *idea* of style to inform our work and help us get started. It is possible to borrow certain elements or even a broad aesthetic principle from a composer without imitating their language. This *idea* of style can take a subjective form and be (again, for the purpose of helping us start a new piece) how a specific sound, technique, or compositional approach sounds to *you*. You can start on a new piece acknowledging your personal associations. This sound represents *to me* the style of Debussy, or this particular orchestration represents *to me* the style of Rimsky-Korsakov, or this rhythmic structure represents *to me* the voice of Messiaen.

A new work could be started by deliberately following your personal stylistic associations.

How about a new piece for solo piano with three sections: Debussy, Bach, and Liszt?

Improvisation

New works can branch out of spontaneous creations. Play an instrument; improvise by yourself and with others. Record, transcribe your improvisations and use them to start new compositions.

Connecting Worlds

An interesting way to generate new ideas could come from making connections between the "worlds" that you transit on a daily basis that are apparently not connected. This approach can be fruitful and lessen the pressure of having to create something new! Connecting *things* that already exist requires a particular use of creativity.

This process is derivative from the concept of *lateral thinking* which can create a context for unexpected and surprising reasoning patterns.[1]

In music composition, the use of the computer as a tool or assistant is a good example. Moreover, in 1957, Lejaren Hiller and Leonard Isaacson used a computer to generate compositional material for their *Illiac Suite*, programming a computer to produce a piece of music. We could also think about the implementation of sensors in music to capture gesture, imitate acoustic instruments, and even generate musical notation.

The list of composers who connected worlds is quite extensive; these are a few representative cases. Olivier Messiaen is a good example of a composer who informed his discipline *connecting worlds*. Messiaen was a studious ornithologist who introduced in his compositions his birdsong transcriptions. Iannis Xenakis managed to translate into music (the very beginning of *Metastaseis* to be specific) the paraboloid shapes of the Phillips Pavilion that he designed as an architect for the World Fair of 1958 in Brussels. Astor Piazzolla—a passionate shark fisher—embedded in his piece *Escualo* the movements of a shark fighting against its captor. John Cage devised the compositional method for his *Music of Changes* after studying the Book of Changes, one of the classics of ancient Chinese philosophy.

Soundscapes and Nature

The sounds and soundscapes of nature (and natural phenomena in general) have been vital triggers for composers. Liszt, Beethoven, Wolf, Schubert, Messiaen, Glass, and many others have used nature as a source in their works. Liszt in his *Nuages Gris* uses an image of nature to challenge the notion of a tonal center, Hugo Wolf in his *Das Verlassene Magdlein* depicts the uncertain colors of dawn with open thirds and the capricious rhythm of fire with irregular figures. With a different approach, Messiaen wrote a catalog of transcribed birdsong that he included in his works. More recently, Philip Glass used scientific experiments on the speed of light in his work *The Light* from 1987.

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[1] Edward de Bono's book *The Use of Lateral Thinking* (1967) could be a way to further the study on this topic.

The sonic evolution of any given day in a specific location could also be a model for a new work. Figure 6.3 depicts a daylong imaginary soundscape.

MORNING		MID-DAY		NIGHT	
Roosters	Mosquitoes, birds, cows			Crickets	
	Few vehicles	Motorcycles, buses, airplanes		Cars and vehicles in the distance	
Isolated voices in the distance		People interacting loudly	People playing games loudly		Sound of fire and quiet music

Figure 6.3. Score of an *imaginary* soundscape at a state park.

In his book *The Soundscape*, R. Murray Schafer reflects on an art form that focuses on listening to the environment. All soundscapes are different, and in order to categorize the sonic phenomena that make a soundscape unique Schafer provides a terminology that can be of help when working on a new composition. A "soundmark" or sonic landmark refers to certain sounds that characterize a location. Another concept is that of "keynote," which—according to Schafer—refers to the sounds that are present but are not perceived or are filtered out cognitively. The latter category is of particular interest as it includes sounds that become perceivable when they are no longer present. On the opposite end of the spectrum, Shafer uses the term "sound signal" to refer to sounds that are in the foreground of a soundscape.

Another concept associated with sound art and soundscapes is the idea of the "soundwalk." Interestingly, a soundwalk refers to a soundscape as experienced in motion, incorporating concepts of dynamism and trajectory between points. Sounds are not static: their relative location, intensity, and color change according to the path of the listener. In a soundwalk, the form *is* the sonic journey between two points in a given location.

This approach lends itself to the incorporation of audio technology in the compositional process. Portable recorders are of priceless aid in the documentation stage. The choice of location to record time of day, trajectory (in a soundwalk), microphone placement, and so on become vital components of the compositional vocabulary.

It is a good practice to record short mountain hikes or city walks and then translate them into a score (a new notational system may be needed!) or just use them as fixed media for electronic or electroacoustic compositions. A *translated* soundscape could be the new composition.

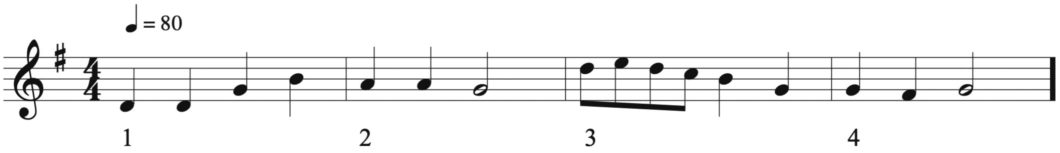
Repeat Yourself

The use of technique to transform material is at the core of musical composition. Augmentations, retrogrades, changes in color and texture, and other manipulations are tools that composers have employed for centuries to do more with less.

A traditional form based on repetition is the repetitive canon or round. This compositional technique employs a melody with one or more literal imitations of itself played after a given duration. The initial melody is called the leader (or *dux*), while the imitative melody is called the follower (or *comes*). In this type of canon, the follower must imitate the leader as an exact replication.

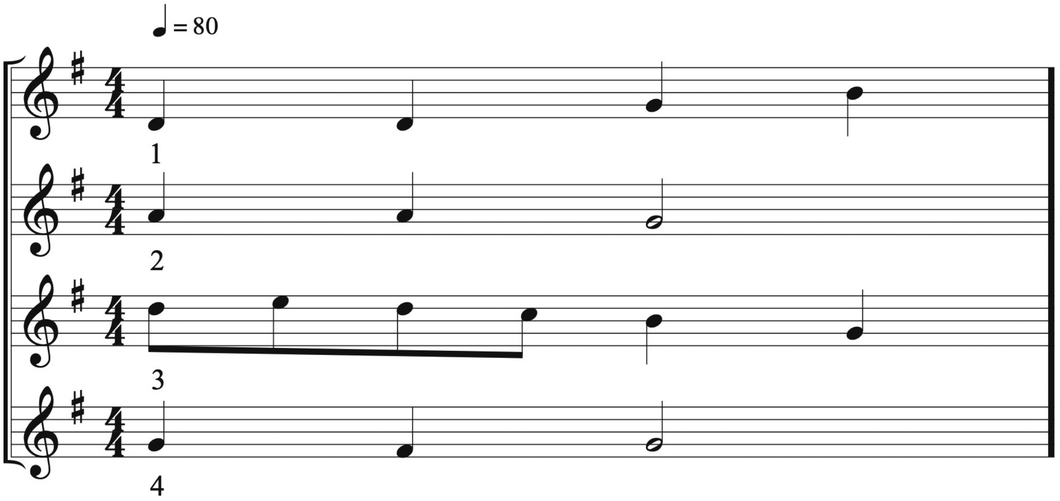
Figure 6.4 shows a simple line of a repetitive four-voice repetitive canon. Each of the voices enters in the downbeat of each measure following the order indicated.

Figure 6.4. Melody of a four-voice round.



Creating a similar structure requires composing the four voices for the duration (in this example this is one measure) where all of the voices are present (Figure 6.5). The "melody" of the round can then be generated by placing each of the measures of the four individual voices back-to-back in any order. The latter step is possible because the resulting aggregate of all four voices will always be the same despite the order in which each of the measures is presented.

Figure 6.5. Technique for writing a four-voice canon.



Transformations and small reinterpretations of the same musical seed are not the only option for doing more. The literal repetition of musical ideas can be also be of great use. Listen to pieces that repeat and reflect on your experience as a listener. Some standard recommended pieces are *In C* by Terry Riley, *Music in Fifths* by Philip Glass, *Music for 18 Musicians* by Steve Reich, and *Hoketus* by Louis Andriessen.

Repetitive music offers the composer the opportunity to show how the piece is constructed through the piece itself. The listening experience is a step-by-step revelation of the compositional plan. When listening to *Music in Fifths* by Philip Glass we discover the piece gradually. The initial experience is (usually) the perfect fifths that move in parallel in the two voices; after, we think about the groupings and how they may be organized (in cells of two, or three notes, maybe four?), and then we reflect on something else (possibly not directly related to the piece) but the main components of the composition have already been revealed to us. Form in minimalist compositions *is* the showing of their compositional process.[2]

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[2] *Repeating Ourselves* by Robert Fink is a good source of though-provoking ideas on repetitive art.

Using the Computer as an Assistant

The computer can be engaged in the creative process in a variety of ways and with an endless number of tools and resources. Any DAW would suffice; software such as MaxMsp, PureData, Logic, Garage Band, Audacity, Reaper, SuperCollider, and many others can help. Let the computer make decisions; create frameworks for the machine to generate output. Listen to the given output, modify the parameters of the framework, and run the program again.

The so-called computer assisted composition process is informed by continuous feedback that pushes the creative act into an iterative speculation/evaluation cycle between the composer/programmer (user) and the machine. Unsurprisingly, such a process features aspects of improvisation, which might be imagined as resembling the activity that takes place in a group of free jazz musicians. This dialog is fluid and never stops because the objective—the imagined aesthetic goal—is a floating target, it only subsists as a short-lived temporal definition.

Exercise 91 proposes the elaboration of a step-by-step compositional "recipe"; 92 incorporates the implementation of a matrix to compose. Numbers 93 and 94 are built after the notions of deconstruction-reconstruction; 95 suggests the use of a compositional plan and 96 is about making lateral connections. Exercise 97 integrates the use of quotations. Number 98 is a written paper and 99 incorporates Eno and Schmidt's *Oblique Strategies*. The last exercise of the book, 100, is an invitation to incorporate the computer as an assistant into the creative process.

Exercises

91

Exercise 91: Writing a Compositional Recipe

In this exercise you will create a **step-by-step recipe** for someone else (not you) to write a short composition. Have in mind that here you will only develop a framework from which a piece of music (or more) will emerge.

Guidelines:

1) The recipe should have between six and ten steps. Number the steps using letters or numbers in the same way you would in a cooking recipe.
2) **Do not use graphics or drawings**. Describe your steps only using words.
3) This work must be for **solo viola.** Check the register of the instrument in Appendix D!
4) Recommendations:
    a. If you decide to leave choices in your guidelines for the composer, make sure that you anticipate all possible outcomes.
    b. If you decide to use "open spaces" or to leave parameters "free," consider possible outcomes. (i.e., if the time signature is free, imagine an outcome that includes duple, triple, irregular, and irrational meters).

c. Ask yourself: What would I like to control in my compositional recipe? Is there a length limitation that I would like to have? Registers? Do I want the composer to employ a specific collection of pitches? What about the different sections of the piece, would any steps refer to the formal organization of the work?
d. Do any of the steps repeat recursively?
e. Would you like your recipe to generate similar or dissimilar compositions? How can you embed that in the step-by-step process?
f. Can the recipe be non-sequential and be followed in any direction?
g. Would you like the violist to write a new piece based on your recipe?

92

Exercise 92: Using a Matrix

In this exercise you will develop a **matrix to compose** a series of melodies for a solo instrument. Here the matrix will predetermine the parameters of pitch and duration.

Guidelines:

1) Instrument: tenor trombone (find its register in Appendix D).
2) Duration: two iterations of the matrix (this will be clarified in the explanation of the process).
3) All parameters not controlled in the matrix are free.

Process:

1) Choose a collection of seven different pitches and put them in a specific **order** (Figure 6.6).

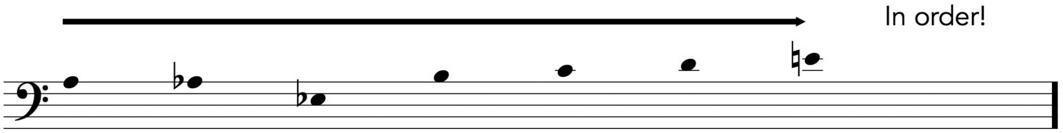


Figure 6.6. Ordered pitch collection.

2) Create a matrix using the pitches in the order that you chose, adding one row to the matrix indicating the rhythmic durations corresponding to each one of the pitches (Table 6.2).

Table 6.2. Matrix of pitch-duration associations.

A	*A*♭	*E*♭	*B*	*C*	*D*	*E*
q	q.	h	q	e	q	h

3) Write a melody that reads through the **order** of the matrix twice (i.e., after you arrive at the E half note, start over with the A quarter note). Note that the articulations, tempo, registers, and dynamics are free (Figure 6.7).

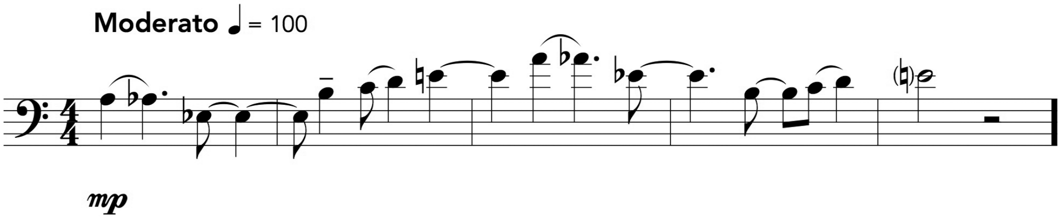


Figure 6.7.
Melody composed after the matrix of Table 6.2.

93

Exercise 93: Deconstructing and Reconstructing I

In this exercise you will **deconstruct** an excerpt, understand its components, and **reconstruct** it in the form of a new work for solo oboe.

Deconstructive process

Analyze exhaustively the given excerpt by Maurice Ravel (Figure 6.8) and make a technical list (of at least 10 items) of your findings. This is the list that you will use to reconstruct the piece, include information and descriptions that could be helpful for that next step. As a general rule, avoid generalities or broad subjective appreciations. Be precise and technical. Here are some examples: the register of the work is between C4 and D5; the C5 is a note with higher weight due to its placement on down-beats and longer rhythmic durations; there are implied harmonies in the form of arpeggios; the melody is based on the Lydian mode; the contour of the melodic line descends a perfect octave from C5 to C4; and so on.

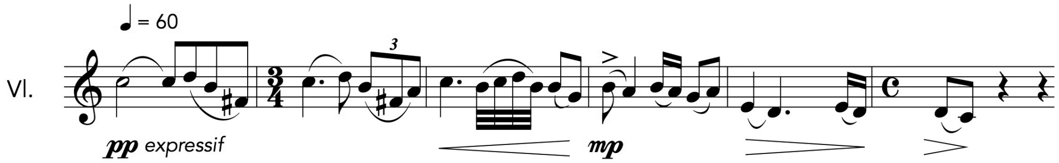


Figure 6.8.
Maurice Ravel, String Quartet in F (excerpt).

Reconstructive process

Write a piece for solo oboe that considers **ALL** the components that you analyzed and dissected in your deconstruction.

Guidelines:

1) Instrument: oboe (find its register in Appendix D).
2) Duration: no more than 24 measures.
3) You can analyze and *dissect* one of the melodies that you composed in Chapter 1 or choose one from Appendix C.
4) Meter and tempo are free.

94

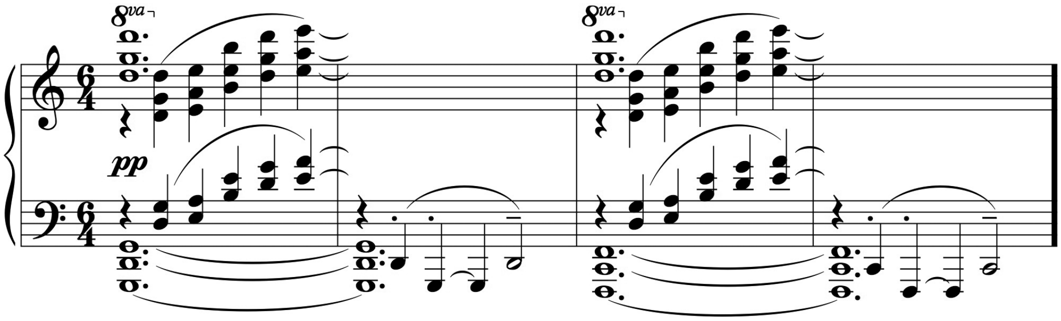
Exercise 94: Deconstructing and Reconstructing II

In this exercise you will **deconstruct** an excerpt, understand its components and **reconstruct** it in the form of a new work for solo piano.

Deconstructive process

Analyze exhaustively the given excerpt of the *Sunken Cathedral* by Claude Debussy (Figure 6.9) and deconstruct it using the musical parameters of rhythm, texture, harmony, and melody as guidelines. Define each of the parameters with technical precision and detail. Make a list of characteristics per parameter.

Figure 6.9.
Claude Debussy, *Sunken Cathedral* (excerpt).



Constructive process

Compose a new piece for solo piano applying ALL the characteristics from your list.

Guidelines:

1) Duration: eight measures.
2) Meter: 4/4.
3) Tempo: quarter note = 48.
4) In your score include articulations, dynamics, tempo, character, and pedal indications.
5) All other parameters are free.

95

Exercise 95: Creating a Compositional Plan

In this exercise you will write a **compositional plan**, a mold after which a piece of music could be composed. For this exercise, the only goal is to write a detailed plan, not a piece after it.

Guidelines:

1) Use brackets to denote the different sections of your work. Label those sections using letters or numbers. The length of the brackets should be proportional to the duration of the projected sections.
2) Use time code to indicate the elapsed time at the end of each section.
3) In the space under the brackets, script the projected characteristics for each section. Write the tempo, character, meter, dynamics, instruments' roles, motifs, articulations, pillar harmonies, melodic contour, repetitions, and so on. Additionally, you can write statements on what the piece is about, registers, rests, use of melodic motifs, text painting considerations, and so on.
4) Imagine as many elements of "the new piece to be" as you can and include them in your plan.

96

Exercise 96: Bringing Ideas from Other "Worlds" to Your Music

In this exercise you will reflect and imagine possible new **connections between different "worlds."** You (the composer) will be the translator between these two—or more—apparently disconnected worlds.

Guidelines:

1) Elaborate and write down three or more ways that you can "connect worlds" in order to inform your work. This example can help you elaborate on the concept and take it to uncharted places:
   a. Think about how birds communicate aurally in the wild (the purpose of this example is not to be of ornithological accuracy but to show how a possible connection may be made). They first develop an intuitive and distinct song that has not only an individual melodic contour but also occupies a specific frequency band in the frequency spectrum.
   b. The sum of all bird songs *completes* the spectrum. However, each of them occupies a specific band that does not overlap with anyone else's.
   c. *Translated* to music, this broad concept coming from nature can let us create a sound that is composed by independent lines that coexist vertically but do not overlap (i.e., the flute only uses the C5 to C6 range, the oboe only exists between G4 and B4, and so on).

97

Exercise 97: Quotations as Triggers

In this exercise you will **appropriate and integrate** in your work *literal* material coming from the work of others. "Quotation" in music can be a source of humor but also a form of homage where you celebrate someone else's work by including it in yours.

Guidelines:

1) Create a catalogue of ten different quotations from the work of others. Use a piano reduction format (the pieces do not have to be for piano in their original format) and label each of them with the title of the work, composer, and measure number when applicable.
2) The choice of the sources is completely free. Explore different composers, styles, and genres.
3) Using exclusively the material from the quotations, compose a piece for solo piano that uses ALL the quotations included in your catalog.
4) DO NOT compose any linking material! This exercise should be exclusively based on excerpts coming from the work of others.
5) Instrumentation: solo piano.
6) In your score indicate tempo markings, articulations, dynamics, pedal, and any other idiomatic indications for the piano. Make sure that you identify (in your score) each of the quotes that you used.
7) Duration: use **ALL** the quotations included in your catalog at least once.
8) All other parameters are free.

98

Exercise 98: Articulating Connections

In this exercise you will **reflect upon and imagine** possible new connections between different "worlds". You (the composer) will be the bridge between these two (or more) apparently disconnected worlds.

Guidelines:

1) For this exercise you will **write a paper** in which you will develop possible ideas for future compositions. In your paper articulate intelligently about how you could connect two apparently distant *worlds* through your music. Ask yourself: how can GPS orbit data inform a music composition? Can a work of music be informed by the weather reports from last year? Can the density of the material of which a given instrument is constructed inform a composition for that said instrument? Chess, movement, constraints, and sound? Form and the soundscape of a complete day on a given location? When fish travel as a school, how do they communicate with each other? Morse code? The rhythm of a basketball game? The trajectory of a map? The relief of the Rocky Mountains?
2) It is of vital importance that in this paper you are specific with your connections; make the effort to specify and describe how the connections that you found (or created) could inform a future composition.
3) Length: between 500 and 1000 words. 12-point font and 1.5-line spacing.
4) Consider the organization of your thoughts: be clear and to the point. Do not write in the first person and have in mind that the traditional essay structure of introduction, development, and conclusion can be of help.
5) Do not try to include all your creative connections in one paper.

99

Exercise 99: Oblique Strategies by Brian Eno and Peter Schmidt

This exercise is intended to explore lateral thinking through the implementation of Brian Eno and Peter Schmidt's *Oblique Strategies*. This card-based method promotes creativity and lateral thinking through constraints. The *Oblique Strategies* (see http://stoney.sb.org/eno/oblique.html) comprises a set of over 100 cards, each of which is a suggestion of a course of action or thinking to assist in creative situations.

For this exercise start a sketch or a new piece from scratch. The process is very simple: flip one of the cards and let it inform or trigger the very beginning of the work. Reflect about the contents of the card. When your workflow feels stuck, flip another card and let it guide the direction of your next compositional move.

100

Exercise 100: The Computer as Assistant

In this exercise you will incorporate the **computer as assistant** in your creative process. Much more than a priceless aid for engraving, the computer can engage the composer in a dialog and help develop, generate, and transform ideas.

Ideas and suggestions on how to incorporate the computer as assistant in the creative process:

1) Use random number generators to control meter changes and note durations.
2) Use lists to generate harmonies. You can limit the amount of simultaneous sonorities and let the computer decide on the rest. Imagine a program that generates lists of four elements (that could be each of the pitches of a chord) with the condition that the following chord generated has at least one pitch in common with the previous one.
3) Create a sampler and develop a routine to play it. Listen to its output, reexamine the code, and reevaluate. A simple example in SuperCollider could look like this when using Pdef/:

```
Pdef(
   \rhythm,
         Pbind(
         \instrument, \string,
         \dur, 4,
         \stretch, 2,
         \buf, Prand(e[\Violaarco], inf), // Sound selection
         \rate, 1,
         \semitoneTranspose, [0,3.0].choose, // <- Random
         transposition within a range of a minor third
         \tremolo, 0.1,
         \vibrato, 0.1,
         \amp, {rrand(0.05, 0.1)}, // <- Random amplitude
         within a range
         \pan, {rand2(0.3)}, // <- Random panning
         \envTimeScale, 4,
         \out, 1,
   );
).play(quant: 2);
```

4) Interact with the MIDI Transform function in Logic. Reverse, transpose, and apply different mathematical operations to the pitch, velocity (dynamics), and MIDI channel.
5) Use the software Spear (or similar) to manipulate the spectrum of a recorded sound. Use that new sound to interact with a live instrument, to generate new sounds, to trigger new ideas for orchestration.
6) Use the computer to copy and paste material. Identical repetition can have a hallucinogenic effect, try it, reflect on it, and do it again.
7) Object oriented software such as MaxMsp or Pure Data can nurture your creative process. Appropriate and transform the patches contained in the tutorial files.
8) Use your computer to listen to music. Be aware of the music of your time!

APPENDICES

A) Grading Rubric

The exercises contained in this book should be evaluated using the following grading rubric. Note: the instructor can assign the percentiles assigned to each criterion.

Table A.1 Grading

Criteria	Percentile	Definition	Grade
Followed guidelines		The student followed diligently the guidelines and constraints established in the exercise.	
Orchestration		The student used the instruments accurately, showing knowledge of their ranges and transpositions. Also provided dynamics, articulations and tempo markings.	
Idiomatic use of the instruments		The student notated specific techniques for the employed instrumental forces (e.g., bowing, breath marks, mutes, etc.).	
"Open spaces"		The student took creative advantage of the aspects of the exercise not constrained or left "free" in the guidelines.	
TOTAL			

B) Sample Curricula

Individual lessons: 12-week PLAN 1 (1 and 2 could be sequential). All exercises can be assigned multiple times.

Table B.1 Individual lessons suggested curriculum—Plan 1

Week	Exercises	Topic	Notes
1	1, 8	Melody	Focal point and triads
2	3, 4		Create your scale
3	91	Pre-composition	Compositional recipe
4	21	Harmony	Transitions
5	22, 26		Segments and triads
6	87	Form	Palindromes
7	41, 42	Rhythm	Math
8	48		Morse code
9	97	Pre-composition	Quotations
10	62, 64	Texture	Homorhythmic
11	63		Motifs
12	96	Pre-composition	Compositional recipe
Final project	The final project for the semester should have a minimum set of constraints. The framework should only address general guidelines such as duration (e.g., between 4′ and 6′) or instrumentation available.		

Individual lessons: 12-week PLAN 2

Table B.2 Individual lessons suggested curriculum—Plan 2

Week	Exercises	Topic	Notes
1	2, 4	Melody	Create a scale
2	11, 12		Graphic and integer notation
3	Chapter VI	Pre-composition	Create a composition plan
4	23, 27	Harmony	Symmetry
5	37, 35		Clusters and pedal tones
6	82	Form	Modules
7	52, 54	Rhythm	Polymeter and motifs
8	55, 56		Displacement, talea and color
9	86, 89	Form	Monolithic, minimal
10	65, 68	Texture	Phasing and ostinatos
11	69, 70		Aleatoric
12	92, 97	Pre-composition	Quotations
Final project	The final project for the semester should have a minimum set of constraints. The framework should only address general guidelines such as duration (e.g., between 4′ and 6′) or instrumentation available.		

Group composition class: 12-week PLAN 1 (1 and 2 should be sequential). All exercises can be assigned multiple times.

Table B.3 Group lessons suggested curriculum—Plan 1

Week	Exercises	Topic	Notes
1	1, 2	Melody	Focal point
2	11, 12		Graphic and integer notation
3	7, 8		Triads
4	15, 16		Probabilities and 12-tone row
5	21, 22	Harmony	Transitions
6	24, 26		Triads and harmonic series
7	29, 33		12-tone row and polychords
8	37, 39		Clusters
9	41	Rhythm	Math transformations
10	42, 46		Segments and the rhythm of a text
11	52, 53		Polymeter
12	59, 60		Eliminations and pulse
Final project	The final project for the semester should have a minimum set of constraints. The framework should only address general guidelines such as duration (e.g., between 4′ and 6′) or instrumentation available using the instrumentalists in the class. Ideally, students in the class will produce a final recital of their works, managing performance space, programs, concert order, invitations, etc.		

Group composition class: 12-week PLAN 2

Table B.4 Group lessons suggested curriculum—Plan 2

Week	Exercises	Topic	Notes
1	61, 63	Texture	
2	74		Color
3	68		Ostinato
4	69, 70		Aleatoric
5	80	Form	
6	82		Modular
7	84		Variations
8	87		Palindromes
9	91	Pre-composition	Compositional recipe
10	95		Plan
11	98		Lateral thoughts (paper)
12	100		
Final project	The final project for the semester should have a minimum set of constraints. The framework should only address general guidelines such as duration (e.g., between 4′ and 6′) or instrumentation available using the instrumentalists in the class. Ideally, students will produce a final recital of their works, managing performance space, programs, concert order, invitations, etc.		

C) Select Anthology of Scales and Musical Examples

12-tone rows:

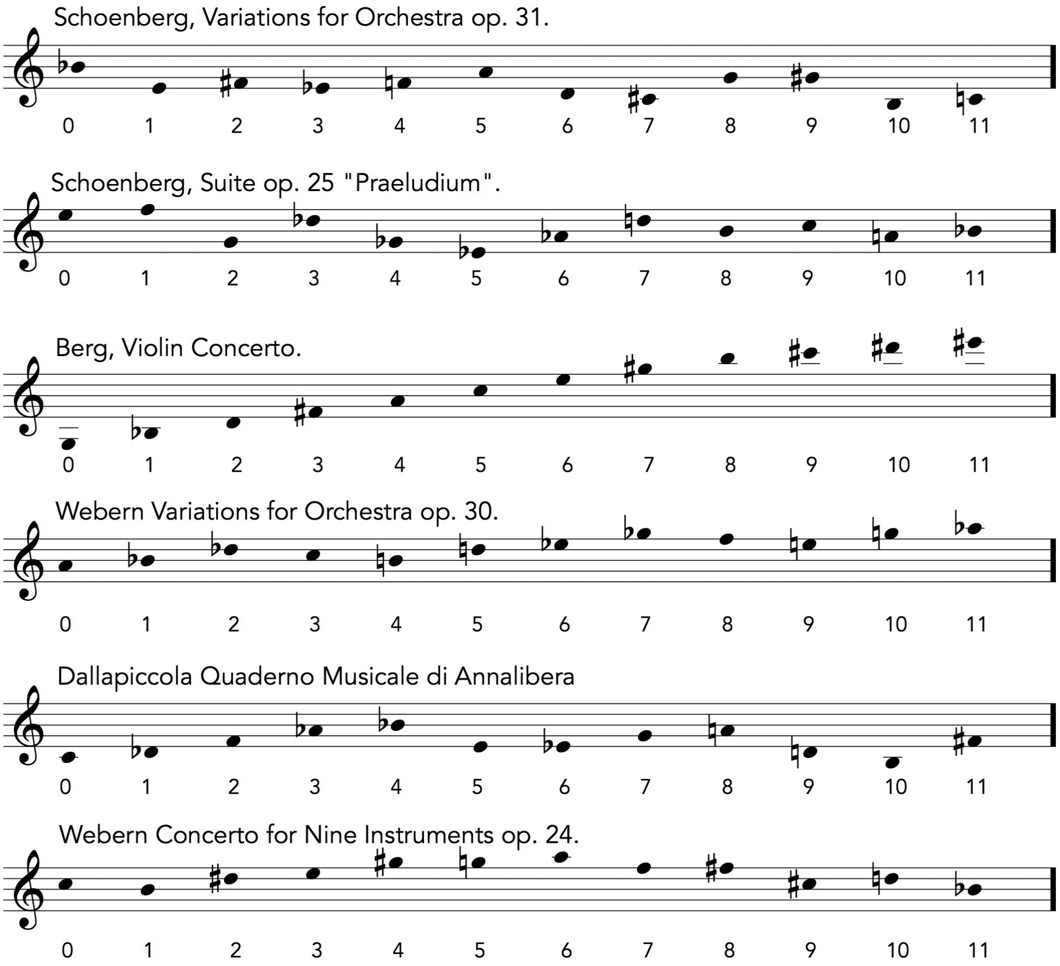

Schoenberg, Variations for Orchestra op. 31.
0 1 2 3 4 5 6 7 8 9 10 11
Schoenberg, Suite op. 25 "Praeludium".
0 1 2 3 4 5 6 7 8 9 10 11
Berg, Violin Concerto.
0 1 2 3 4 5 6 7 8 9 10 11
Webern Variations for Orchestra op. 30.
0 1 2 3 4 5 6 7 8 9 10 11
Dallapiccola Quaderno Musicale di Annalibera
0 1 2 3 4 5 6 7 8 9 10 11
Webern Concerto for Nine Instruments op. 24.
0 1 2 3 4 5 6 7 8 9 10 11

Figure C.1. Select list of 12-tone rows.

Other scales (all starting on C):

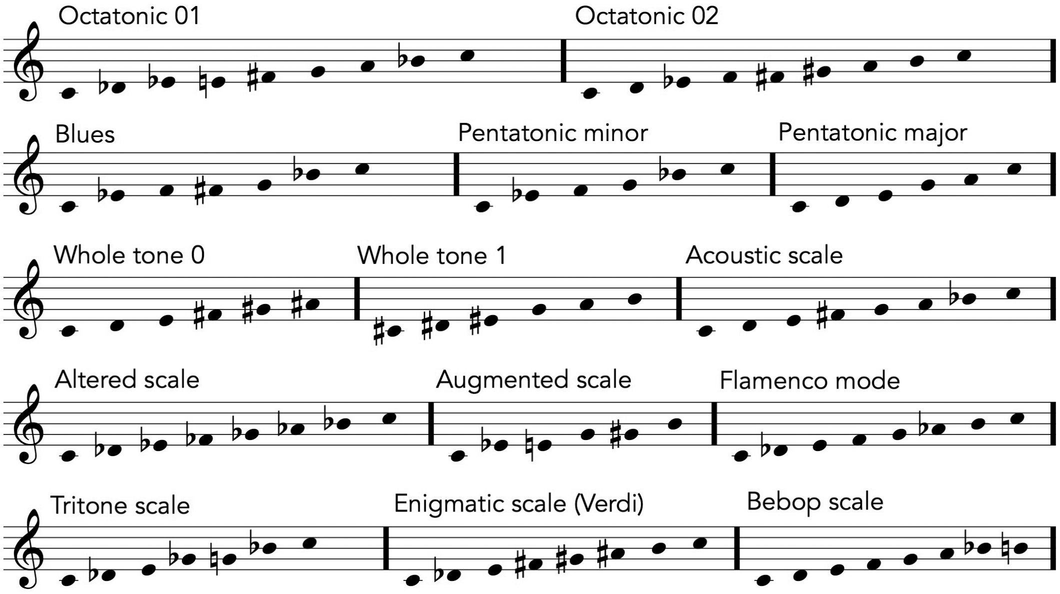

Octatonic 01
Octatonic 02
Blues
Pentatonic minor
Pentatonic major
Whole tone 0
Whole tone 1
Acoustic scale
Altered scale
Augmented scale
Flamenco mode
Tritone scale
Enigmatic scale (Verdi)
Bebop scale

Figure C.2. Select list of *other* scales.

Melody excerpts:

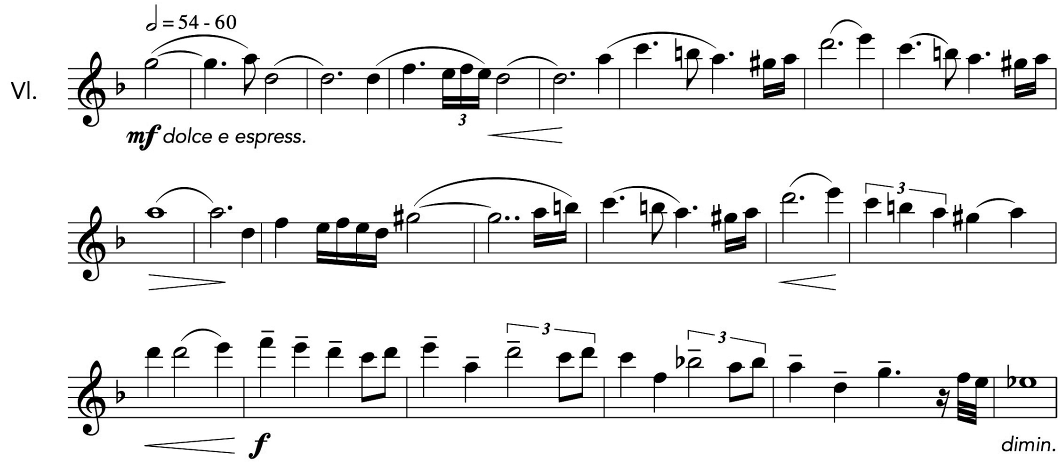

𝅗𝅥 = 54 - 60
Vl.
mf dolce e espress.
3
f
dimin.

Figure C.3. Jean Sibelius, Violin Concerto (excerpt).

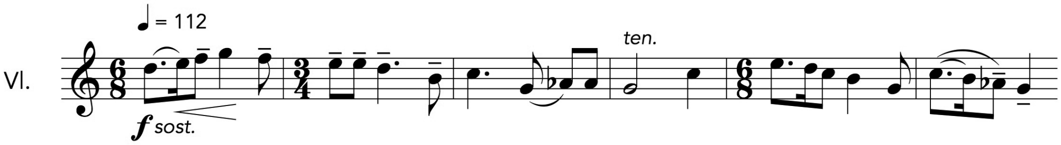

♩ = 112
Vl.
6/8
3/4
f sost.
ten.

Figure C.4. Ralph Vaughan Williams, *Fantasia on a Theme by Tallis* (excerpt).

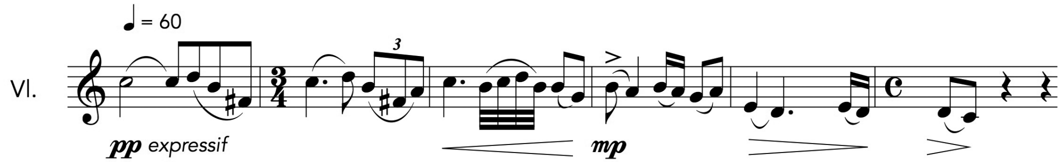

♩ = 60
Vl.
3/4
pp expressif
3
mp

Figure C.5. Maurice Ravel, String Quartet in F (excerpt).

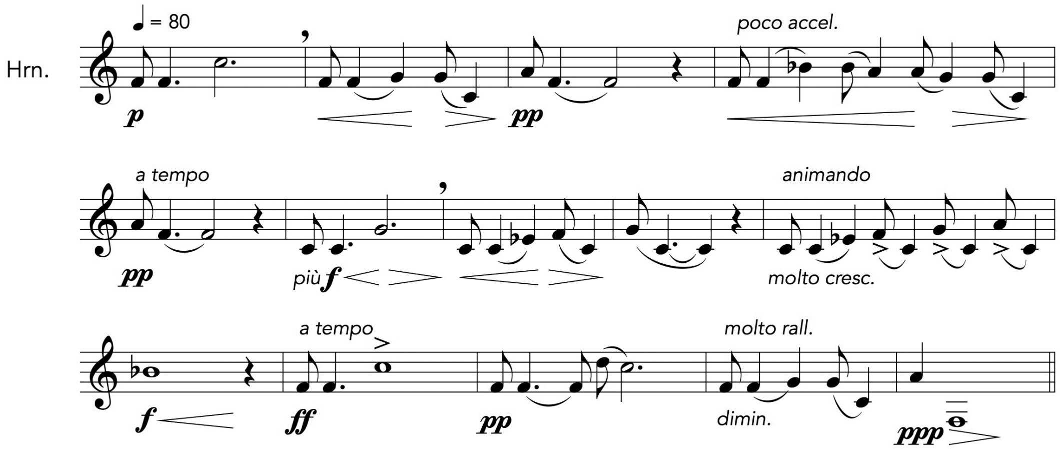

♩ = 80
Hrn.
p
pp
poco accel.
a tempo
pp
più f
animando
molto cresc.
f
a tempo
ff
pp
molto rall.
dimin.
ppp

Figure C.6. Benjamin Britten, *Serenade: Prologue* (excerpt).

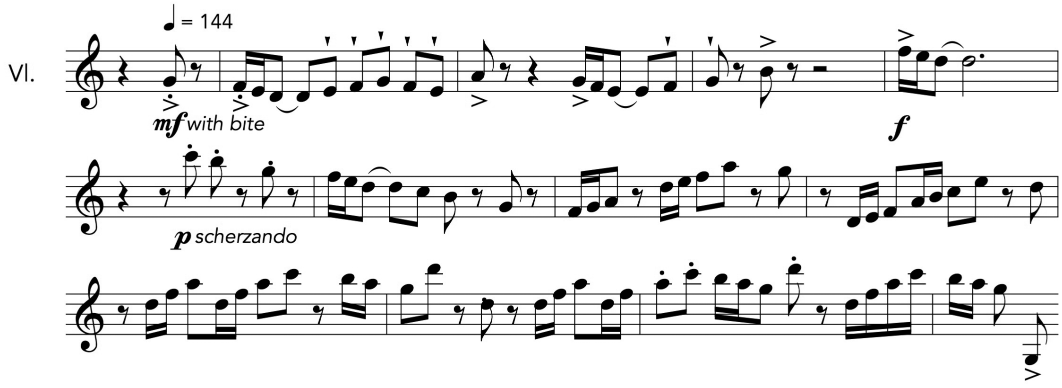

♩ = 144
Vl.
mf with bite
f
p scherzando

Figure C.7. Aaron Copland, Violin Sonata (excerpt).

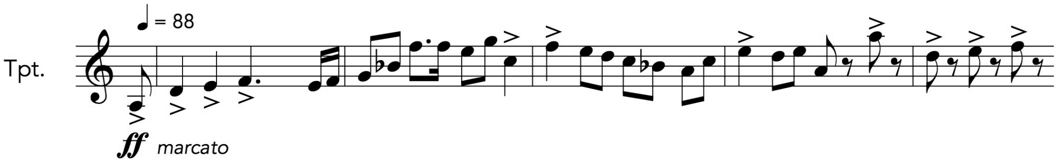

Tpt.
♩ = 88
ff marcato

Figure C.8. Dmitri Shostakovich, Symphony No. 5 (excerpt).

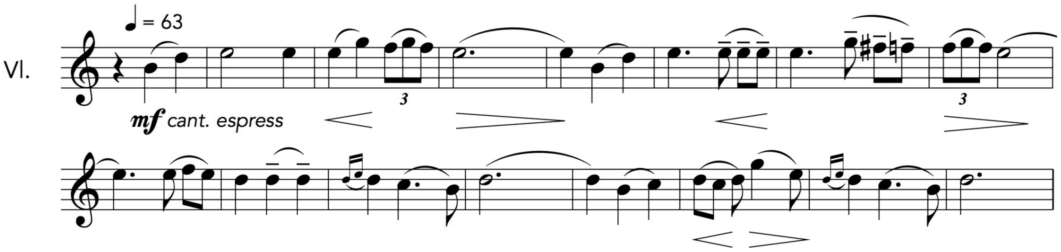

Vl.
♩ = 63
mf cant. espress
3
3

Figure C.9. Aram Khachaturian, Violin Concerto (excerpt).

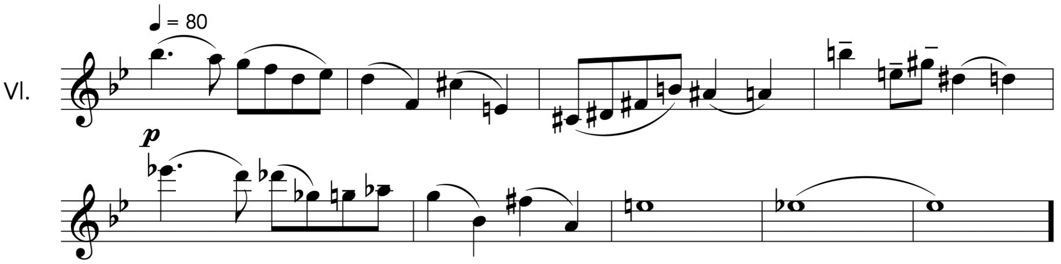


Figure C.10. Sergei Prokofiev, Violin Concerto No. 2 in G minor (excerpt).

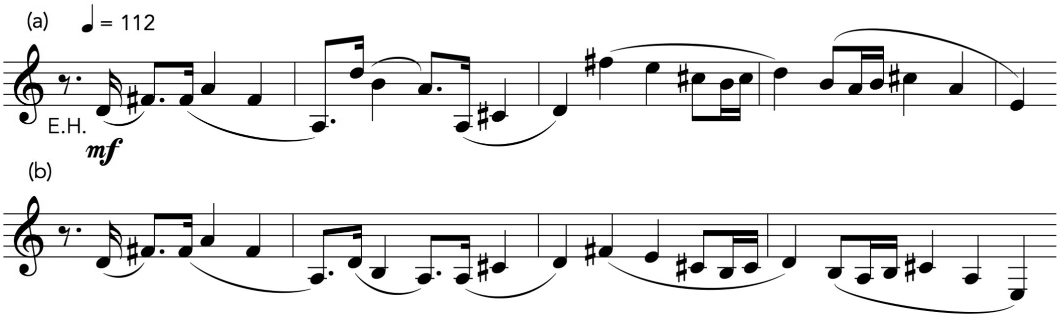


Figure C.11. Darius Milhaud, Violin Concerto No. 2 (two excerpts).

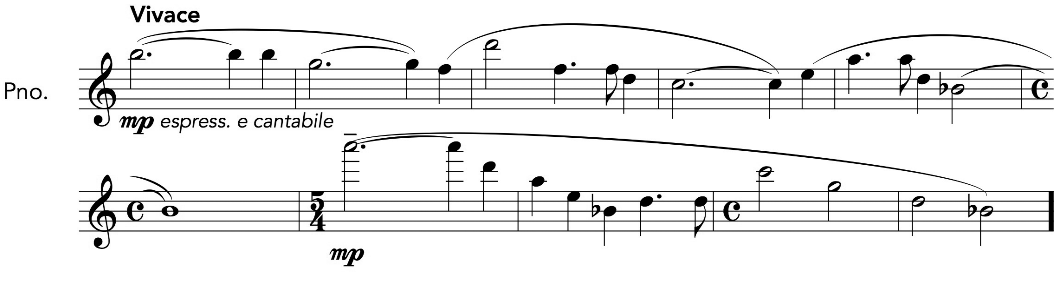

Vivace
Pno.
mp espress. e cantabile
5
4
mp

Figure C.12. Aaron Copland, Piano Sonata (excerpt).

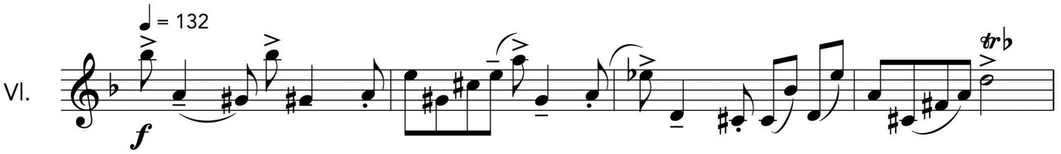


Figure C.13. Sergei Prokofiev, Symphony No. 5 (excerpt).

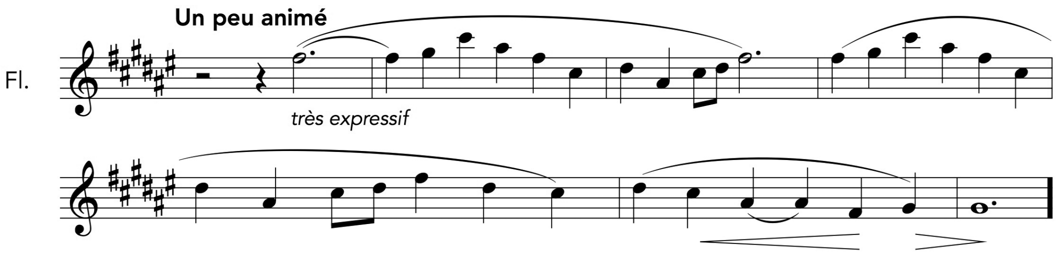

Un peu animé
Fl.
très expressif

Figure C.14. Claude Debussy, *Nocturnes: Nuages* (excerpt).

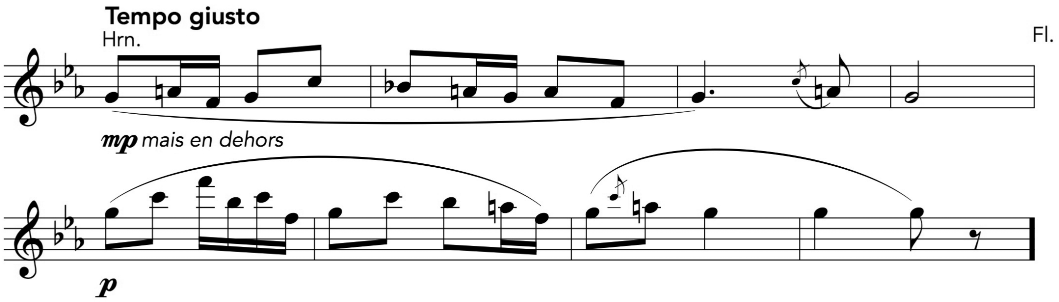

Tempo giusto
Hrn.
Fl.
mp mais en dehors
p

Figure C.15. Igor Stravinsky, *The Rite of Spring* (excerpt).

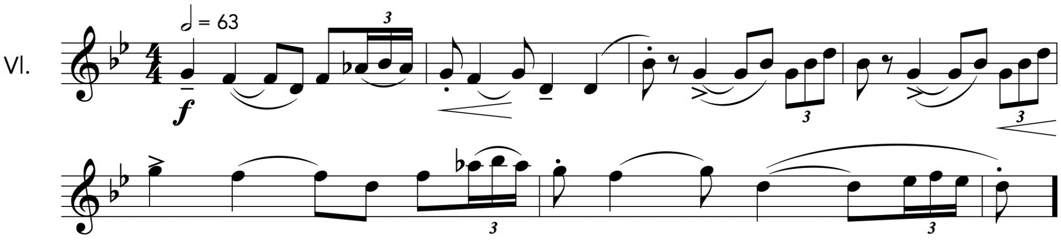


Figure C.16. Claude Debussy, String Quartet (excerpt).

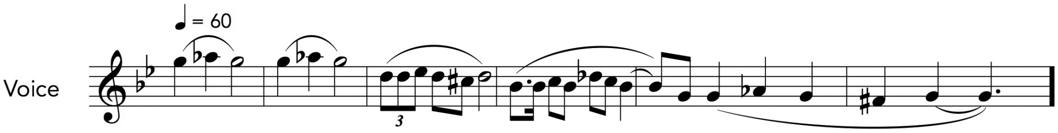


Figure C.17. Benjamin Britten, *Serenade: Dirge* (excerpt).

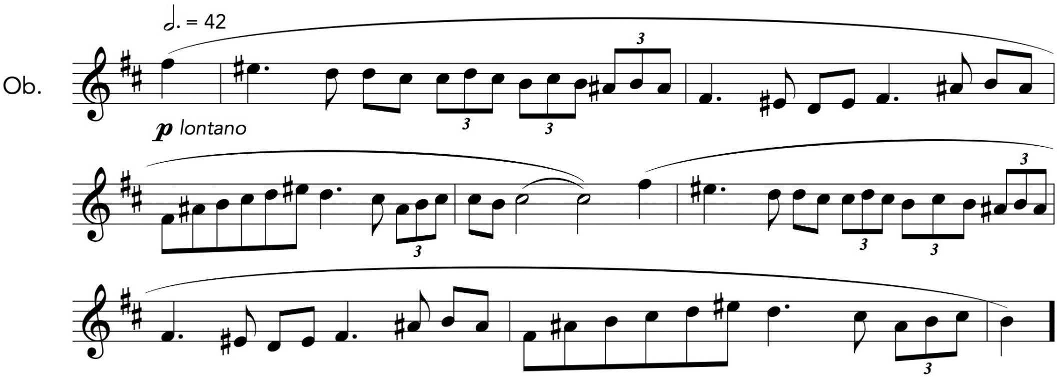

𝅗𝅥. = 42
Ob.
p lontano
3

Figure C.18. Charles Griffes, *The Pleasure Dome of Kubla Khan* (excerpt).

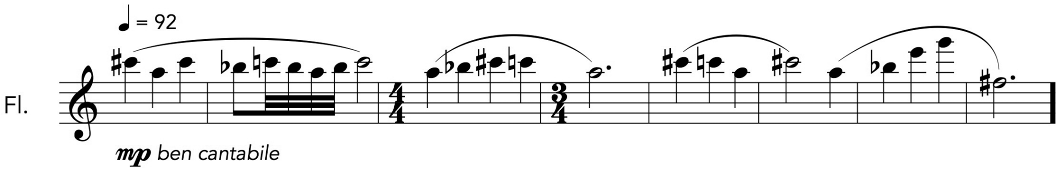

♩ = 92
Fl.
mp ben cantabile
4/4
3/4

Figure C.19. Igor Stravinsky, *Octet* (excerpt).

Figure C.20.
Olivier Messiaen, *Theme and Variations* (excerpt).

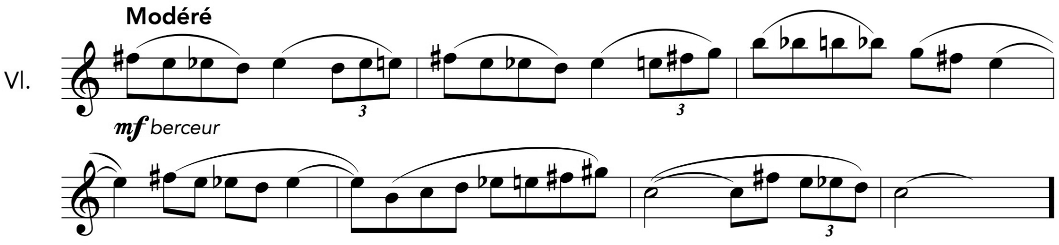

Modéré
Vl.
mf berceur
3
3
3

Figure C.21.
Dmitri Shostakovich, Symphony No. 1 (excerpt).

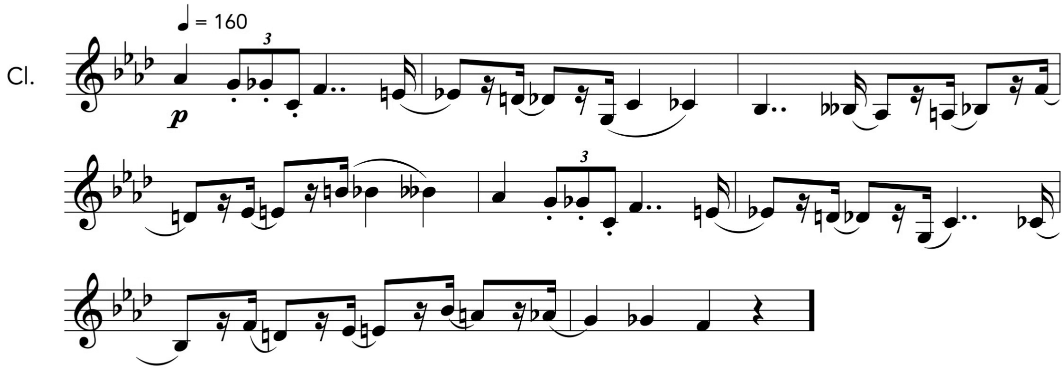


Figure C.22.
Paul Hindemith, Symphony in E flat (excerpt).

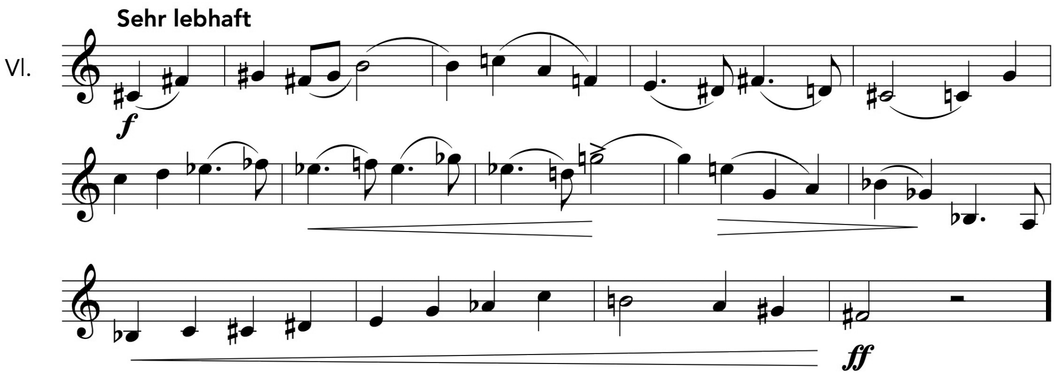
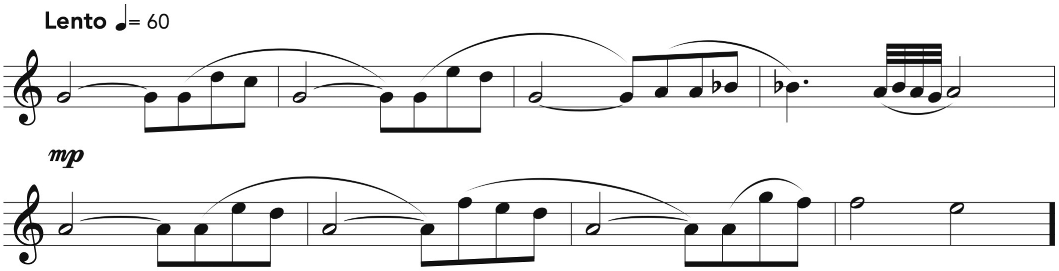

Sehr lebhaft
Vl.
f
ff

Figure C.23.
Astor Piazzolla, *Adios Nonino* (excerpt).



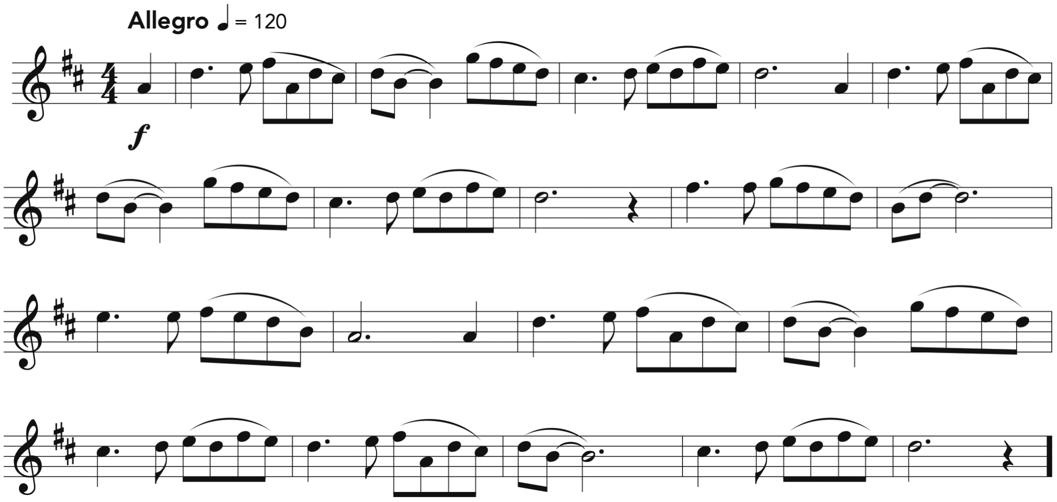

Allegro ♩ = 120
f

Figure C.24.

Godwin Sadoh, *Iya Ni Wura Iyebiye* (excerpt).

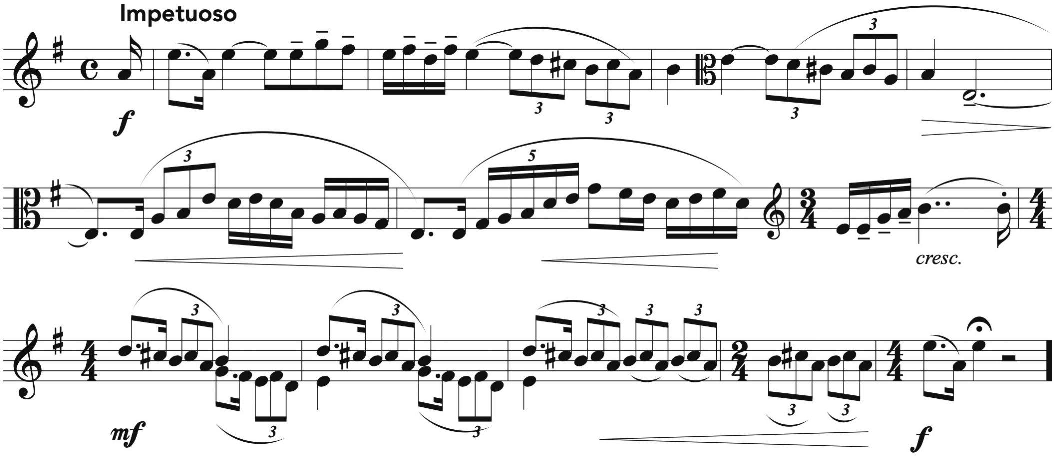

Impetuoso
f
cresc.
mf
f

Figure C.25.

Rebecca Clarke, Sonata for Viola and Piano (beginning).

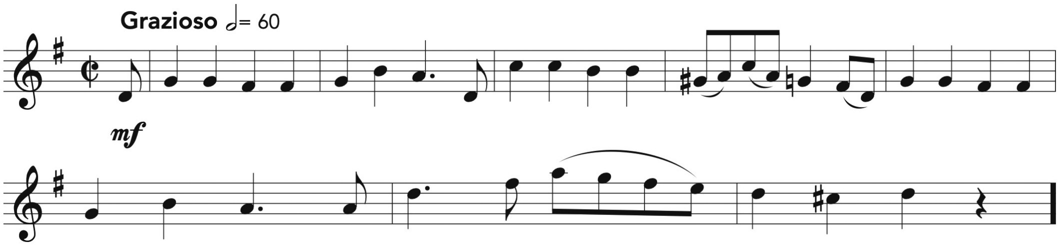

Grazioso 𝅗𝅥 = 60
mf

Figure C.26.

Joseph Bologne, Chevallier de Saint Georges, theme from Sonata No. 4 for two violins.

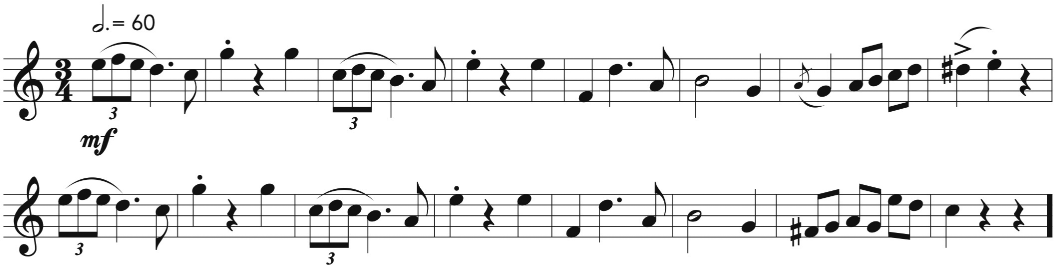


Figure C.27.

Basile Barés, *La Louisianaise* (beginning).

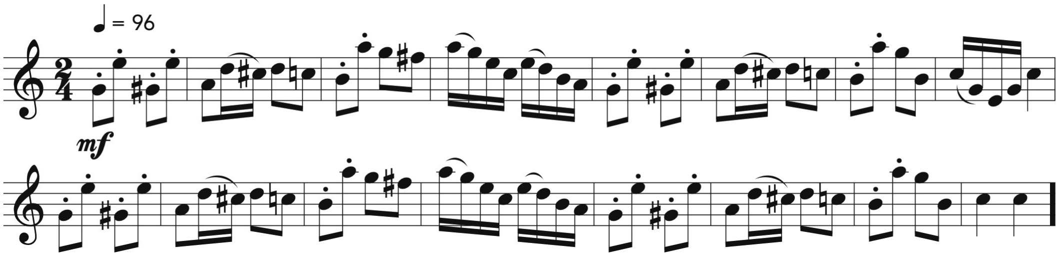


Figure C.28. Basile Barés, *La Coquette Grande Polka* (beginning).

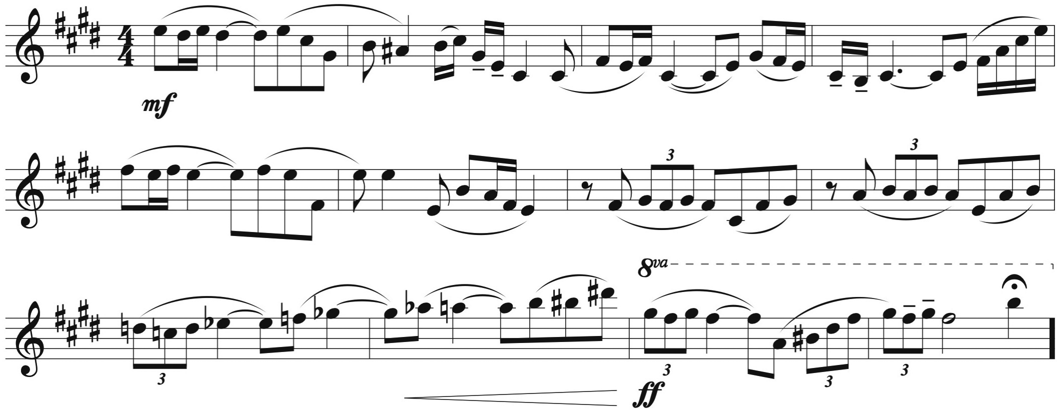


Figure C.29. William Grant Still, Suite for Violin and Piano (2nd movement).

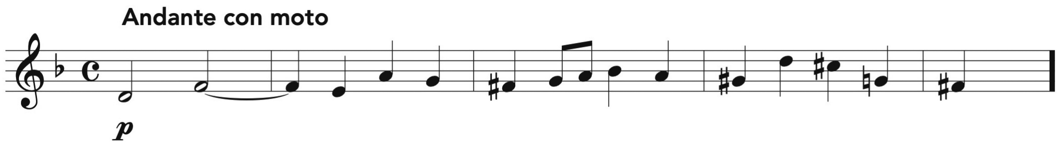

Andante con moto
p

Figure C.30. Clara Schumann, subject from Fugue III from *Three Preludes and Fugues*, Op. 16.

Short piano excerpts:

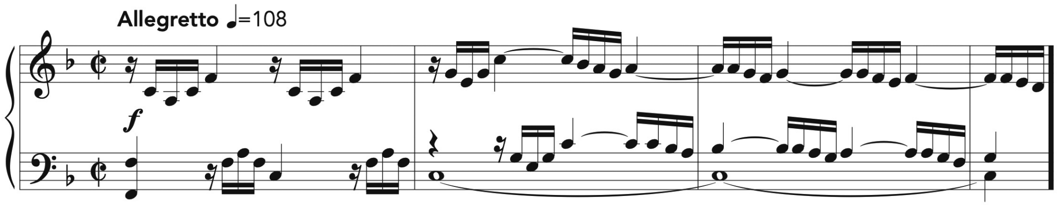

Allegretto ♩=108
f

Figure C.31. Henry Purcell, Prelude from Suite in F, Z. 669.

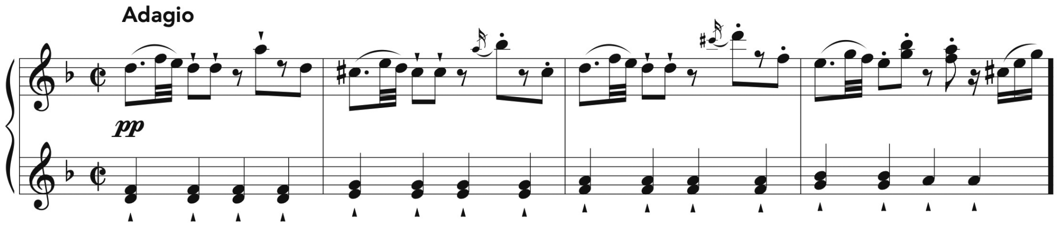


Figure C.32. Joseph Haydn, Sonata No. 24 (3rd movement).

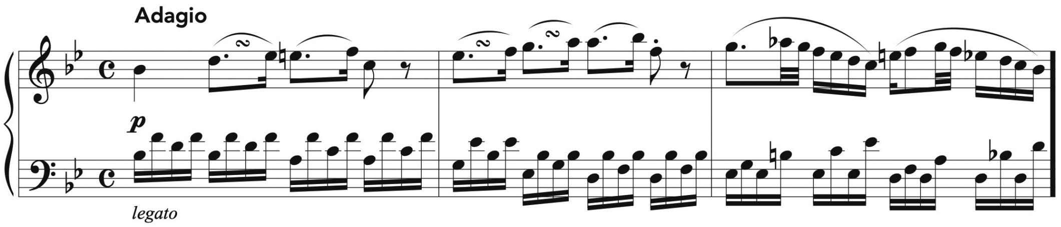

Adagio
p
legato

Figure C.33. W. A. Mozart, Sonata No. 12, K.332 (3rd movement).

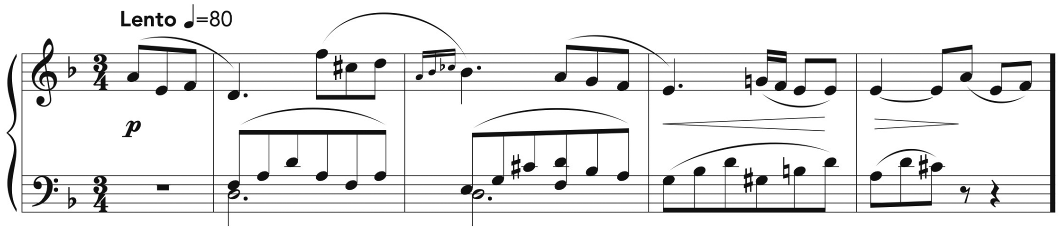


Figure C.34.

John Field, Nocturne No. 15 (Song without Words).

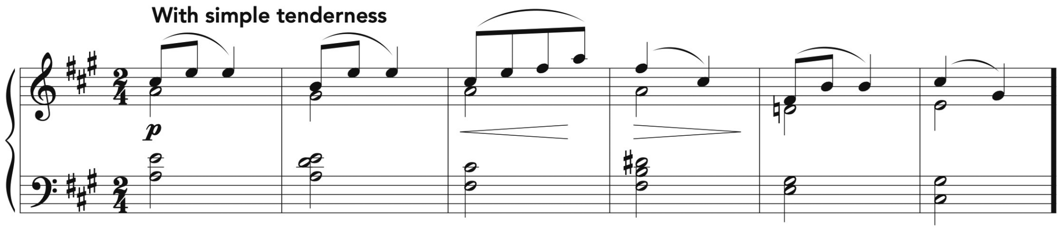

With simple tenderness
p

Figure C.35.

Edward MacDowell, *To a Wild Rose* (from *Woodland Sketches*, Op. 51, No. 1).

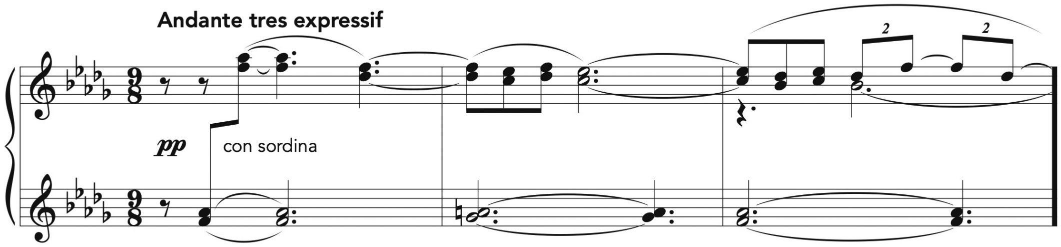

Andante tres expressif
pp
con sordina
2
2

Figure C.36.

Claude Debussy, *Claire de Lune* (from *Suite Bergamasque*).

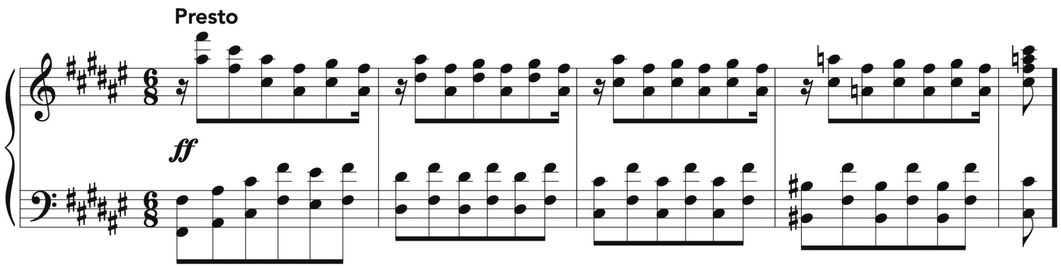


Figure C.37.

Fanny Mendelssohn, *Scherzo* (from *February in Das Jahr*).

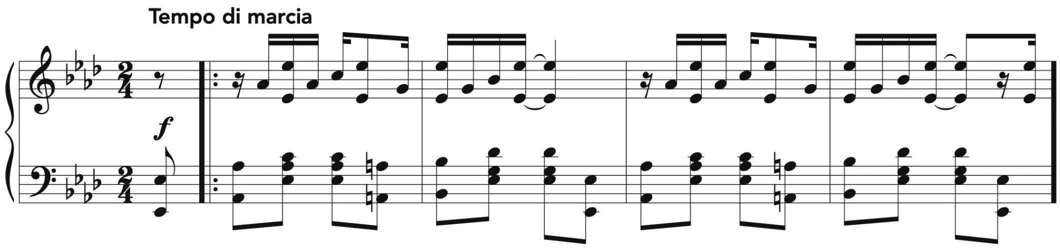

Tempo di marcia
f

Figure C.38.

Scott Joplin, *Maple Leaf Rag*.

Figure C.39. Franz Liszt, *Consolation No. 3.*

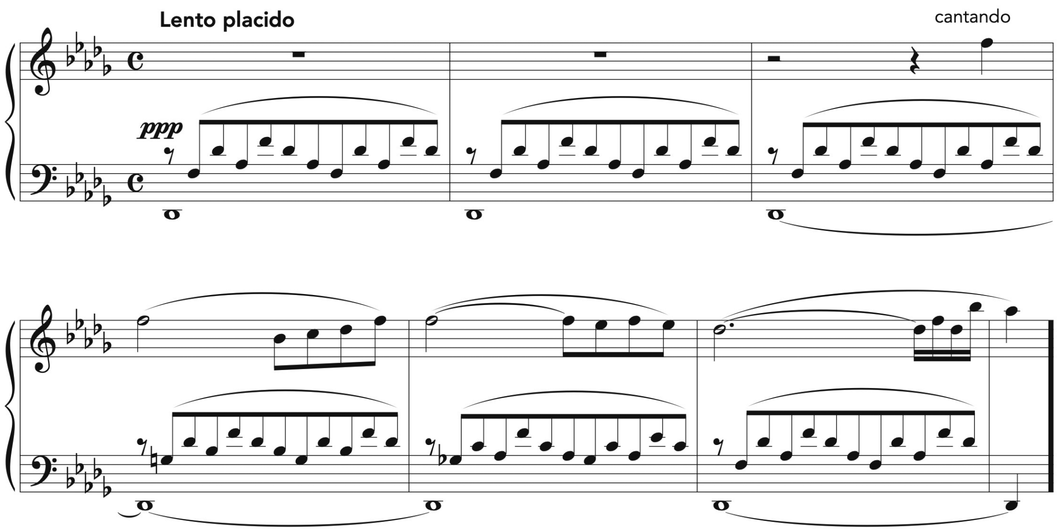
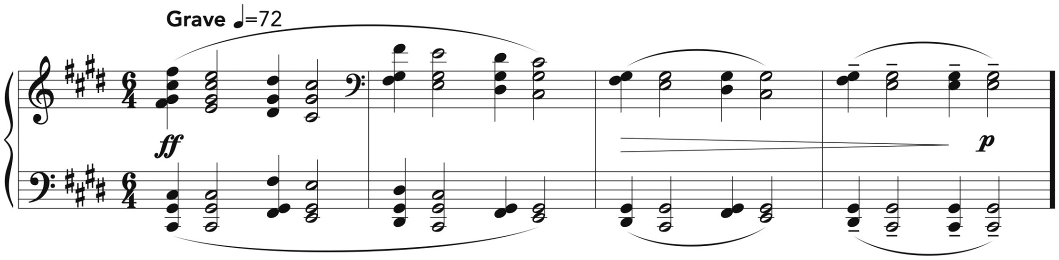
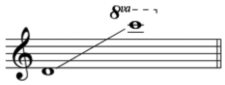
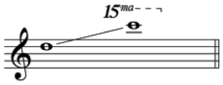
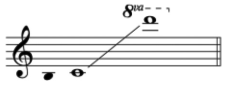
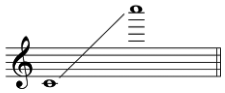
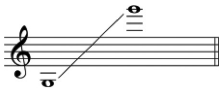
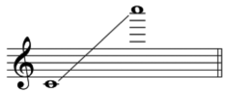
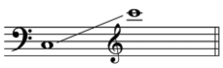
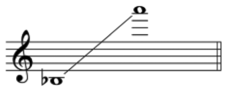
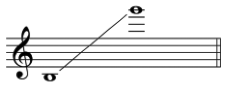
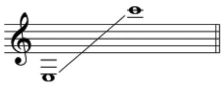

Lento placido
cantando
ppp

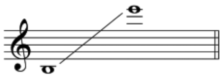
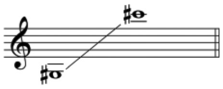
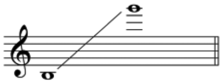
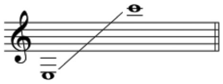
Figure C.40. Carlos López Buchardo, *Oye Mi Llanto (Huaynu).*

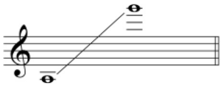
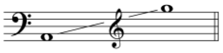
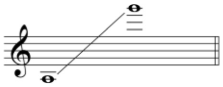
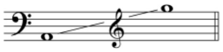
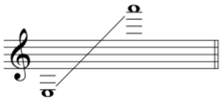
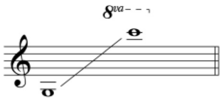
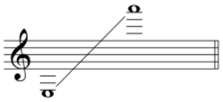
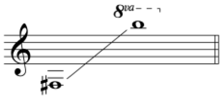
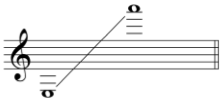
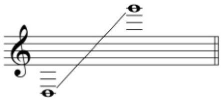
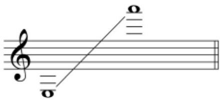
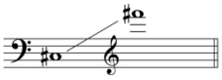
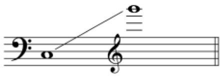
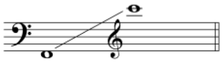
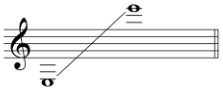
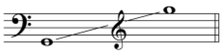

Grave ♩=72
ff
p

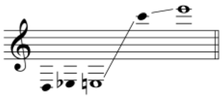
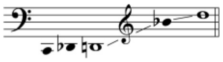
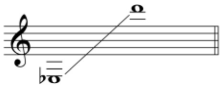
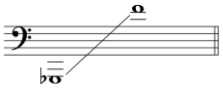
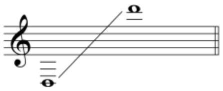
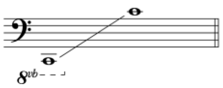
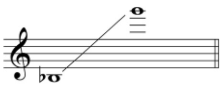
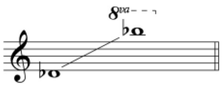
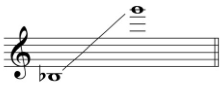
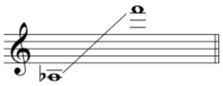
D) Table of Instrument Ranges and Transpositions

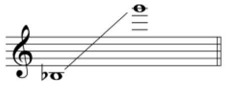
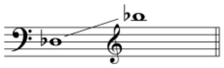
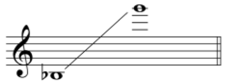
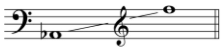
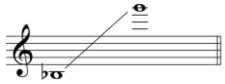
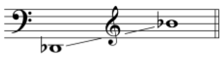
Table D.1 Chart of instrument ranges and transpositions.

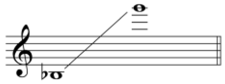
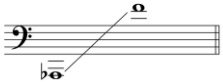
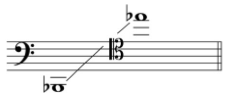
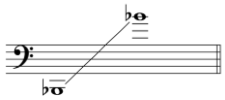
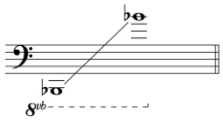
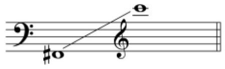
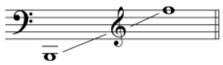
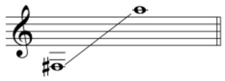
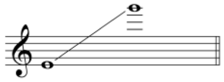
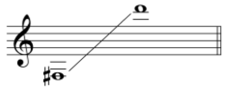
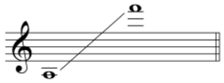
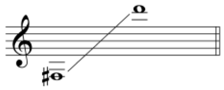
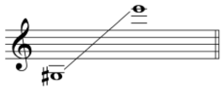
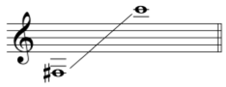
Instrument	Transposition	Written	Concert	Range
Piccolo	8va UP			D5–C8
Flute	As Written			B3–D7
Alto Flute	P4 DOWN			G3–G6
Bass Flute	8va DOWN			C3–C6
Oboe	As Written			B♭3–A6
English Horn	P5 DOWN			E3–C6

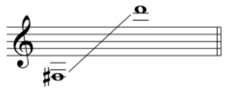
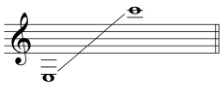
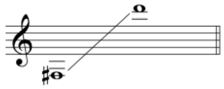
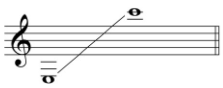
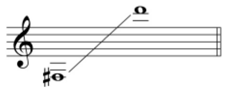
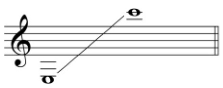
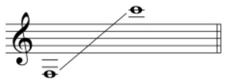
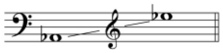
Instrument	Transposition	Written	Concert	Range
Oboe d'Amore	m3 DOWN			G♯3–C♯6
Oboe da Caccia	P5 DOWN			E3–C6

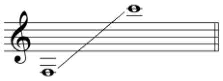
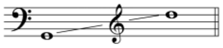
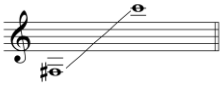
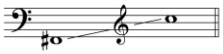
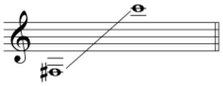
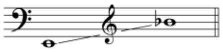
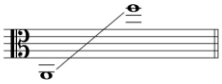
Instrument	Transposition	Written	Concert	Range
Heckelphone	8va DOWN			A2–G5
Bass Oboe	8va DOWN			A2–G5
E♭ Clarinet	m3 UP			G3–C7
D Clarinet	M2 UP			F♯3–B6
B♭ Clarinet	M2 DOWN			D3–G6
A Clarinet	m3 DOWN			C♯3–F♯6
Basset Horn	P5 DOWN			F2–C6
E♭ Alto Clarinet	M6 DOWN			G2–G5

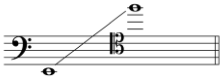
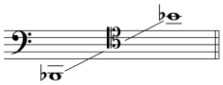
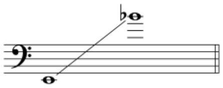
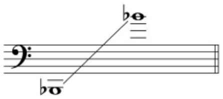
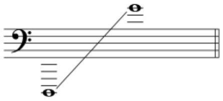
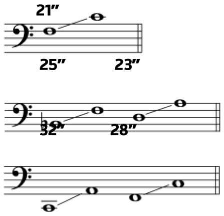
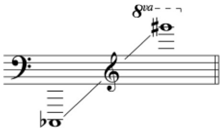
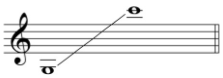
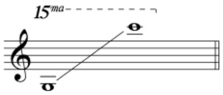
Instrument	Transposition	Written	Concert	Range
Bass Clarinet	8va + M2 DOWN			C2–D5
E♭ Contrabass Clarinet	8va + M6 DOWN			G♭1–F4
B♭ Contrabass Clarinet	15ma + M2 DOWN			C1–C4
E♭ Sopranino Saxophone	m3 UP			D♭4–B♭6
B♭ Soprano Saxophone	M2 DOWN			A♭3–F6

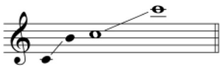
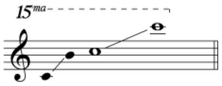
Instrument	Transposition	Written	Concert	Range
E♭ Alto Saxophone	M6 DOWN			D♭3–B♭5
B♭ Tenor Saxophone	8va + M2 DOWN			A♭2–F5
E♭ Baritone Saxophone	8va + M6 DOWN			D♭2–B♭4

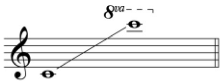
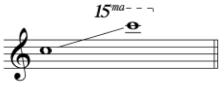
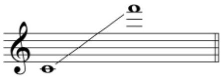
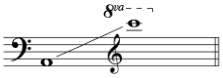
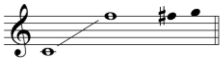
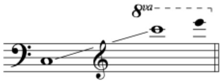
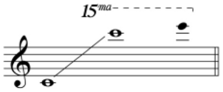
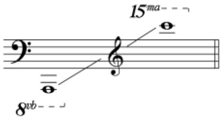
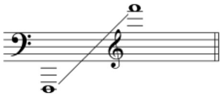
Instrument	Transposition	Written	Concert	Range
B♭ Bass Saxophone	15ma + M2 DOWN			A♭1–F4
Bassoon	As Written			B♭1–E♭5
Contra-bassoon	8va DOWN			B♭0–B♭4
Horn in F	P5 DOWN			B1–F5
B♭ Piccolo Trumpet	m7 UP			E4–G6
E♭ Trumpet	m3 UP			A3–F6
D Trumpet	M2 UP			G♯3–E6
C Trumpet	As Written			F♯3–C6

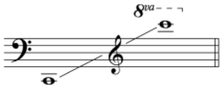
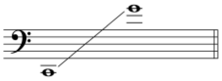
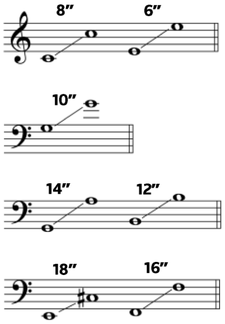
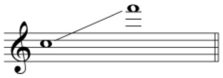
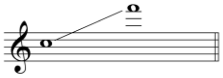
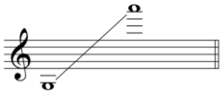
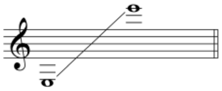
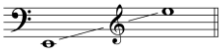
Instrument	Transposition	Written	Concert	Range
B♭ Trumpet	M2 DOWN			E3–C6
Cornet	M2 DOWN			E3–C6
Flugelhorn	M2 DOWN			E3–C6
E♭ Bass Trumpet	M6 DOWN			A♭2–E♭5

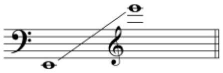
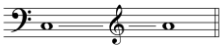
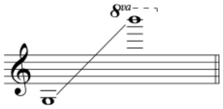
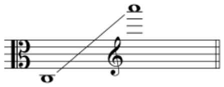
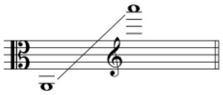
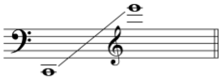
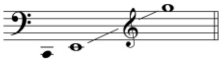
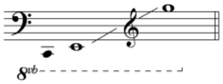
Instrument	Transposition	Written	Concert	Range
D Bass Trumpet	m7 DOWN			G2–D5
C Bass Trumpet	8va DOWN			F♯2–C5
B♭ Bass Trumpet	8va + M2 DOWN			E2–B♭4
Alto Trombone	As Written			A2–F5

Instrument	Transposition	Written	Concert	Range
Tenor Trombone	As Written			E2–F5
Bass Trombone	As Written			B♭1–B♭4
Baritone	As Written			E2–B♭4
Euphonium	As Written			B♭1–B♭4
Tuba	As Written			D1–G4
Timpani	As Written			C2–C4
Harp	As Written			C♭1–G♯7
Glockenspiel	15ma UP			G6–C8

Instrument	Transposition	Written	Concert	Range
Crotales	15ma UP			C6–C8

Instrument	Transposition	Written	Concert	Range
Xylophone	8va UP			C5–C8
Vibraphone	As Written			C4–F6
Marimba	As Written			A2–C7
Chimes	As Written			C4–G5
Celesta	8va UP			C4–E8
Piano	As Written			A0–C8
Harpsichord	As Written			F1–F6

Instrument	Transposition	Written	Concert	Range
Organ Manuals	As Written			C2–C7
Organ Pedals	As Written			C2–E6
Roto Toms	As Written			E2–E5
Saw	As Written			C5–F6
Flexatone	As Written			C5–F6
Mandolin	As Written			G3–A6
Guitar	8va DOWN			E2–E5

Instrument	Transposition	Written	Concert	Range
Cimbalom	As Written			E2–E6
Banjo	As Written			C3–A4
Violin	As Written			G3–B7
Viola	As Written			C3–A6
Viola d’Amore	As Written			A2–A6
Cello	As Written			C2–E6
Contrabass	8va DOWN			C1–G4

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